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Annual Report of the FEDERAL SECURITY AGENCY

1950

Public Health Service

FEDERAL SECURITY AGENCY

OSCAR R. EWING, *Administrator*

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Dr. THEODORE J. BAUER, Division of Venereal Disease.
Dr. HALBERT L. DUNN, National Office of Vital Statistics.
Mr. CARL E. SCHWOB, Division of Water Pollution Control.

Letter of Transmittal

FEDERAL SECURITY AGENCY,
PUBLIC HEALTH SERVICE,
Washington, D. C., October 31, 1950.

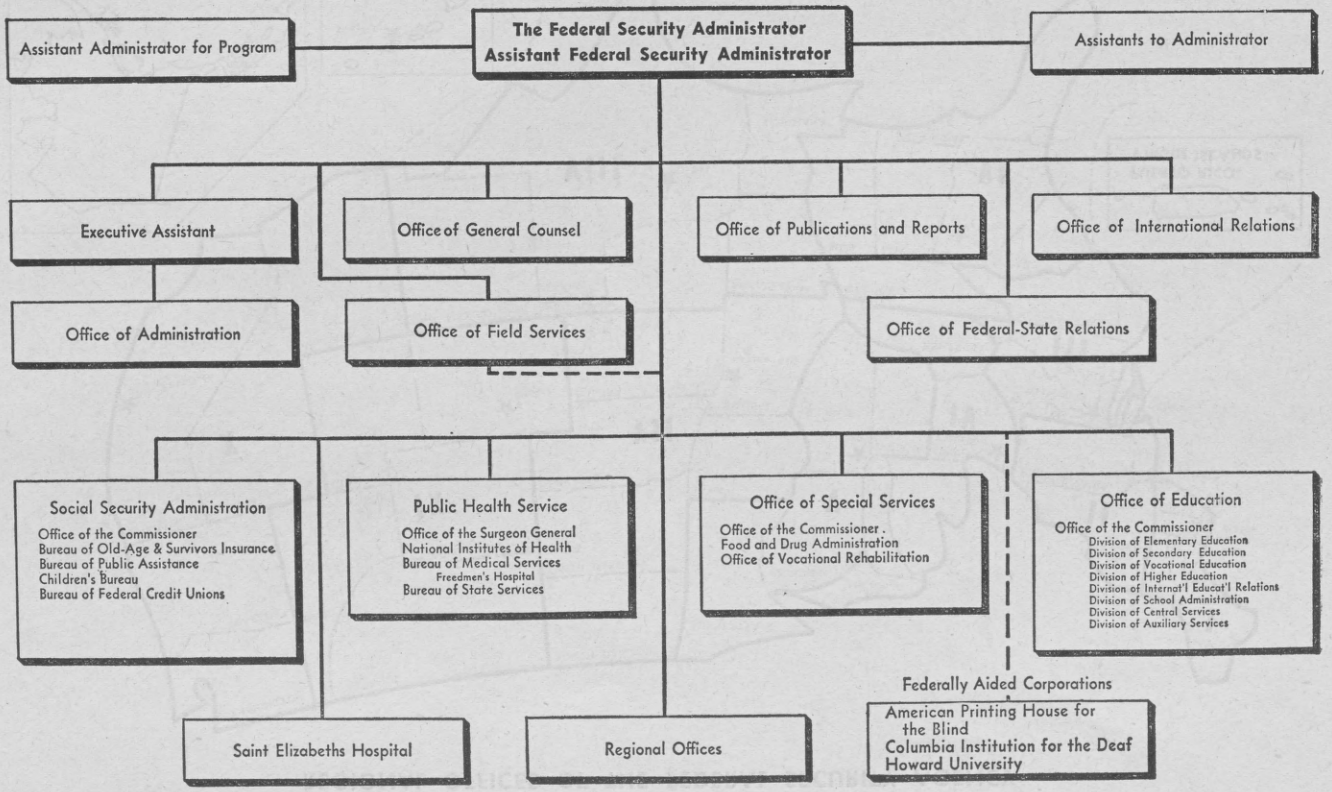
The Honorable OSCAR R. EWING,
Federal Security Administrator.

DEAR MR. EWING: In accordance with the act approved July 1, 1944 (PL 410, title V, sec. 511) I have the honor to submit for transmission to the Congress the seventy-eighth annual report of the United States Public Health Service for the fiscal year ended June 30, 1950, which is the one hundred and fifty-second year of this organization's existence.

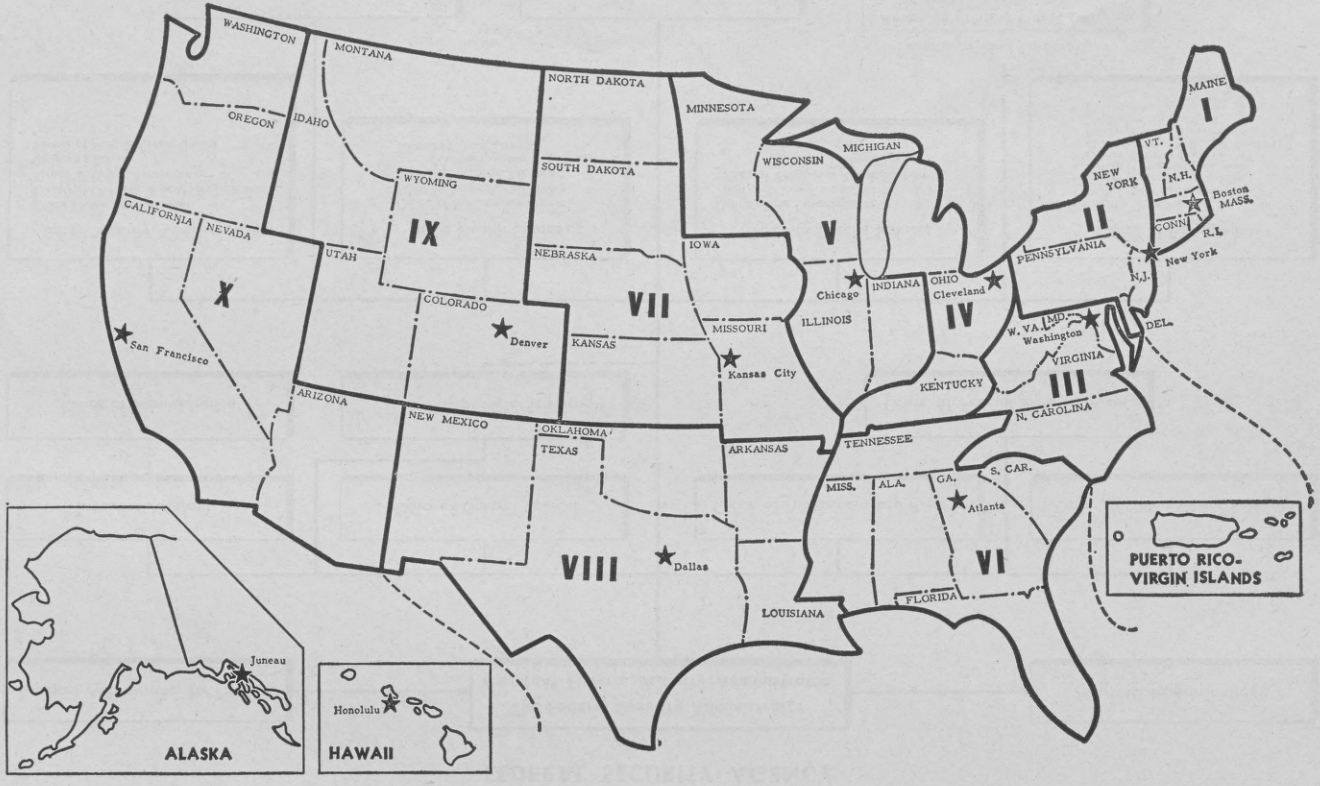
Respectfully,

LEONARD A. SCHEELE,
Surgeon General.

FEDERAL SECURITY AGENCY



REGIONAL OFFICES OF THE FEDERAL SECURITY AGENCY



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Public Health Service

In its annual report for 1949, the Public Health Service summed up the gains made in American health during the first half of the twentieth century. The report also called attention to the major health problems which now confront our Nation.

During the past year, important advances were made along the health front in the United States. These new gains occurred in the medical and related sciences, in our health resources, and in our State and local health services. Even while these advances were in the making, the solid work done by our health agencies in recent years again showed good results.

A Progress Report on American Health

OUR 1949 HEALTH RECORD

Our health record was good in 1949,[1] even though there is still plenty of room for improvement. The general death rate has been declining slightly each year for the past 10 to 20 years. In 1949, it declined again: from 9.9 per 1,000 population in 1948, to 9.7 per 1,000. Although more babies were born in the United States in 1949 than in any year except 1947, fewer infants died in the first year of life. Deaths from chronic diseases showed little change from the 1948 figure, although mortality from these diseases has been mounting with our growing and "aging" population.

About 3.7 million babies were born in 1949. At the same time, death rates among infants and mothers again declined. In 1949, the

[1] All vital statistics are given for the calendar year.

infant mortality rate was 31 per 1,000 live births and the maternal mortality rate was 9 per 10,000 live births. The birth rate was 24.1 per 1,000 population as compared with 24.2 in 1948.

Heart disease and cancer still held first and second places in the list of most frequent killers. These two causes together accounted for half of the 1,446,000 deaths from all causes in 1949. The death rate from heart diseases was 20 percent higher than in 1940; and the cancer death rate was 15 percent higher.

Fewer cases of diphtheria, influenza, malaria, scarlet fever, typhus fever, whooping cough, and smallpox were reported in 1949 than in any other year. In contrast, new highs were reported for chickenpox, amebic dysentery, and poliomyelitis.

As predicted in the 1949 report, the polio epidemic of that year produced between 40,000 and 45,000 cases; 42,173 were reported. Nine States and the District of Columbia now report cases of poliomyelitis so as to show whether the disease resulted in paralysis or not. Health agencies need such information in order to estimate the kinds of health services that will be needed in the community to take care of an epidemic. Of the 8,400 cases reported from the nine States and the District of Columbia, 47 percent were paralytic; about 40 percent were non-paralytic; and 13 percent were unspecified.

National marriage and divorce rates also declined in 1949. The marriage rate was 10.7 per 1,000—the lowest since 1939. The divorce rate declined for the third consecutive year, but slightly, from 2.8 divorces per 1,000 population in 1948 to 2.6 per 1,000 in 1949.

A NEW ERA IN MEDICAL RESEARCH

In the spring of 1949 came the dramatic announcement by American scientists that cortisone and ACTH (adrenocorticotropic hormone) are effective in the treatment of rheumatoid arthritis and other rheumatic diseases. This discovery brought immediate hope to millions of sufferers from these ailments; but medical scientists saw even greater hope in the discovery.

Cortisone and ACTH are hormonal substances normally produced by the body. Before 1949, scientists had no convincing proof of a relation between hormonal imbalance and arthritis and rheumatism. The discovery that cortisone and ACTH are effective in treating these diseases gave scientists that proof and a clue to the relation of many other chronic diseases to hormonal imbalance.

By the close of 1950, scientists in many parts of the country were testing the effectiveness of cortisone and ACTH in no less than 50 diseases. Manufacturers had gone far toward solving the formidable problems of producing the substances in sufficient quantities for research and treatment. Work had begun in many laboratories on the synthesis of new biochemical substances, thus opening a new area in

chemotherapy after its recent triumphs in diseases caused by protozoa and bacteria.

Of even greater significance were the new lines of research which medical scientists are pursuing as a result of the new findings about cortisone and ACTH. Intensive study of substances produced by the glands of internal secretion, of metabolism, and of the interrelationships of all these processses, may uncover basic mechanisms in the body that account for the difference between health and disease. Medical scientists also have in cortisone and ACTH valuable tools for the study of many of the chronic diseases which have baffled the medical world for generations. There may be a common factor responsible for the causation of such widely different diseases as arthritis, glomerular nephritis, and diabetes. In the future, medical scientists will pursue these new leads with greater hope of getting answers to questions that have resisted their best research efforts.

The interest of the public and the professions in cortisone and ACTH and in the new era of medical research now opening has brought about another advance in our health services. The Eighty-first Congress set aside a special fund in the Public Health Service's 1951 budget to use in expanding research on cortisone, ACTH, and related compounds. Congress also authorized the Public Health Service to establish a broad program of research, aid to research and professional education, and health services in arthritis, rheumatism, and other metabolic diseases. The new law also established a program on the study of nerve diseases, such as cerebral palsy, multiple sclerosis, and blindness.

INCREASING OUR HEALTH RESOURCES

Health personnel is our most important health resource. We need adequate numbers of research scientists, physicians, dentists, nurses, engineers, professional educators, and trained workers in related fields. Public Health Service fellowships for young scientists and grants to professional schools for the training of medical and dental students are helping to increase our supplies of some of these essential workers. Grants to the States also help to train public health personnel.

Our goal of adequate hospital and health facilities is being attained gradually through the National Hospital Construction Program. By the end of June 1950, a total of 65,000 hospital beds and 250 health centers were being added to our health resources. These facilities are distributed among 1,300 projects, more than 300 of which have been completed.

EXPANDING HEALTH SERVICES

Our State and local health departments expanded their services to the public by an increase of about $15 million in the fiscal year

1950. The total expenditure was $231 million, of which the Federal government provided $45 million in grants; State governments provided $96 million and local governments, $90 million. The new funds in 1950 were spent chiefly to increase and strengthen local health services. Next priorities went to the control of cancer, heart disease, and other chronic ailments, and to expand community mental health services.

Our State and local health departments also were becoming more and more alert to the necessity for medical services in the prevention of chronic disease or of prolonged invalidism due to chronic diseases or accidents. They were making common cause with voluntary health agencies, social welfare agencies, hospitals, and public medical care programs in attacking this great problem of chronic illness.

TOWARD A HEALTHIER WORLD

Winning a healthier world is one of the basic goals of our country's total effort for world-wide peace and freedom. During 1950 we demonstrated more than ever our determination to help the people of underdeveloped areas solve their own health problems.

Health missions, sponsored by the Economic Cooperation Administration, the Department of State, or the Public Health Service, brought direct help from the United States to many distant lands. American experts and institutions, including both private and governmental agencies, participated in programs of the World Health Organization, the Pan American Sanitary Bureau, and other international agencies. In May 1950, Congress passed legislation authorizing the President's long-range program of technical assistance to underdeveloped areas: the Point Four program. Many health projects have been planned under this program which will make it possible for the people in some of the world's most disease-ridden areas to learn and apply modern public health methods.

LOOKING AHEAD

The future is hopeful for public health in the United States. The advances of a single year give us confidence to push forward toward our major goals.

Medical science is on the march toward new victories over the diseases and impairments that afflict mankind. We have made good progress in meeting our needs for hospitals and health centers. Our supply of specially trained health personnel has been increased—although we are still far from the goal of adequate numbers of trained men and women in all fields. Our State and local health agencies are stronger—in funds, staffs, and services—than ever before.

These are real gains, but we have not progressed as far as we should. We can be sure that no public health program has expanded to the point where it can reach its ultimate goal in a year, or 5 years. Some

programs have only just begun to operate; and others are still in the planning stage.

We need to do a great deal of work immediately to improve the efficiency of services to the families and individuals who make up our communities. Our community hospitals and health departments need to work together much more closely than they do at present in most parts of the country. Our health personnel and facilities are not so well distributed that all individuals have an equal opportunity for health, wherever they live. We have not solved the problem of meeting the increasing costs of medical care.

Fortunately, the public and the professions have been gaining valuable experience in working together for the solution of health problems. Teamwork of this sort has increased at the national level, in the States, and in local communities. Leaders in public affairs, as well as in the health professions, now see a great opportunity for solving some of our major health problems through joint planning and action.

A BRIEF BUSINESS REPORT

The Public Health Service in the fiscal year 1950 administered a total of $319 million in appropriations and authorizations. Sixty-five percent of this sum was allocated in grants to agencies, institutions, and individuals outside the Federal Government. Six percent was allocated to the construction of needed facilities for the Public Health Service. The remaining 29 percent covered the entire operations of the Service—including the operation of its hospitals and medical care programs, quarantine service, demonstrations, research activities, technical aid to the States, and administration of grants.

The Public Health Service staff totaled about 16,300 full-time and 747 part-time employees including consultants and members of the National Advisory Councils.

The Commissioned Corps of the Public Health Service comprised 1,185 officers of the regular corps and 967 reserve officers in June 1950. Commissioned personnel include physicians, dentists, scientists, engineers, sanitarians, nurses, dietitians, pharmacists, and physiotherapists.

The reorganization program outlined in the report for 1949 established certain important objectives in the improvement of administrative procedures. Chief among these are (1) decentralization of fiscal, personnel, supply, and management services to the bureaus and divisions; (2) development of improved standards in each of these fields for the guidance of administrators in the operating programs. Excellent progress was made during 1950 toward these major objectives in all administrative fields.

Special task forces, representing the operating bureaus and the Surgeon General's immediate staff, worked on a number of important

problems during the year. A Committee on Publications, for example, completed a detailed study of the Service's entire operation in this field and made valuable recommendations to the Surgeon General for strengthening and improving the publications program. The Executive Staff, under the chairmanship of the Deputy Surgeon General, has developed a program for continuous study of administrative problems affecting all bureaus.

Tables 1 and 2 present detailed information on the finances and personnel of the Service.

The Study of Man

Research, medicine, and public health have been moving slowly toward a new synthesis in theory and practice. The focus of this synthesis is man himself. In past epochs, scientists and practitioners alike have focused their attention chiefly on the diseases to which man is heir; or on particular parts of the human body; or on special factors in man's environment. Now they are coming to view all these separate parts as a whole. At the same time, they are broadening their perspective to include man's social environment as an important influence upon health and disease.

With the advance of biochemistry and biophysics during the past 30 years, there have been vast improvements in the methods, measurements, and instruments available to medical scientists. These tools have made it possible for scientists in highly specialized fields to bring about a closer integration of their disciplines. Some of the most dramatic advances in recent years have been the result of just such a team approach to the study of man—or of a specific problem in human health.

The research programs of the Public Health Service are founded upon this principle of teamwork. In the laboratory, the hospital, or the field, scientists of the Public Health Service, along with their colleagues in other institutions, are coming to rely on one another for special knowledge or skills, to share facilities, and to pool their results as one great contribution to the health, productivity, and general well-being of mankind.

THE CLINICAL CENTER

The Clinical Center of the National Institutes of Health is being constructed especially to promote this coordinated approach to the medical research tasks set for the Public Health Service by the people of the United States. By the close of the fiscal year, the Clinical Center had risen to the fifth of its fourteen stories. One of its auxiliary buildings, the Isotope Laboratory, was completed and the Utility

Table 1.—*Statement of congressional appropriations, authorizations, obligations, and balances for the fiscal year 1950*

[In thousands]

Appropriation titles	Funds available for obligations				Amounts obligated	Balances
	Appropriations and authorizations	Net transfers between appropriations	Other funds	Total available		
Total	$321,530	−$13,743	$80,420	$388,207	$300,049	$88,158
Pay, etc., commissioned officers	1,600	30	[1] 7,834	9,464	9,435	29
Foreign quarantine service	3,141			3,141	3,141	
Control of tuberculosis	9,550	42		9,592	9,574	18
Control of venereal diseases	16,000	−347	[1] 36	15,689	15,641	48
Assistance to States, general	16,600	117		16,717	16,586	131
Control of communicable diseases	7,350	188	[1] 38	7,576	7,545	31
Hospitals and medical care	25,200		[1] 5,522	30,722	30,688	34
Operating expenses, National Institutes of Health	14,000		[1] 879	14,879	12,981	1,898
Operating expenses, National Cancer Institute	20,725			20,725	20,569	156
Training for nurses			[2] 71	71	62	9
Office of International Health Relations	130	7	[1] 15	152	149	3
Mental health activities	13,012		[1] 1,531	14,543	13,855	688
Employee health service programs	167	197	[1] 115	479	466	13
Salaries and expenses	4,400	50	[1] 2	4,452	4,443	9
Administrative expenses, assistance for hospital construction	1,209			1,209	1,200	9
Disease and sanitation investigations and control, Territory of Alaska	1,317			1,317	1,315	2
Operating expenses, National Heart Institute	16,075	−50		16,025	15,528	497
Operating expenses, dental health activities	1,780			1,780	1,759	21
Salaries and expenses, water pollution control	1,200			1,200	1,185	15
Administrative expenses, water pollution control		4		4	4	
Working capital fund, narcotic hospitals			[1] 264			
			[2] 66	330	292	38
Service and supply fund			[1] 986			
			[2] 266	1,252	1,120	132
Grants for research and training projects relating to cancer			[2] 891	891	889	2
Construction of research facilities	16,800	−16,800	[2] 624	624	103	521
Payments to States for surveys and programs for hospital construction			[2] 432	432	332	100
Grants for hospital construction	150,000		[2] 59,764	209,764	126,869	82,895
Grants, water pollution control	1,000			1,000	995	5
Research facilities, National Institute of Dental Research	100	−85		15	3	12
Grants to States, municipalities, etc., for plan preparation, water pollution control		200		200		200
Buildings and facilities, Cincinnati, Ohio		70		70		70
Operation of commissaries, Division of Mental Hygiene	174		7	181	171	10
Defense public works, community facilities, General Services Administration			38	38		38
Assistance to Greece and Turkey, Executive Office of the President			[2] 1	1	[3] −18	19
Mutual Defense Assistance, Emergency Fund, General Area of China, Executive Office of the President		34		34	3	31
Expenses, Economic Cooperation Administration		251	[2] 2	253	175	78
Medical and hospital service, penal institutions		1,526		1,526	1,521	5
Salaries and expenses, Philippine rehabilitation, Department of State		445	[2] 744	1,189	1,146	43
Salaries and expenses, American Sections, International Commission		22		22	22	
Displaced Persons Commission		286		286	180	106
Maritime training fund, U. S. Maritime Commission		70		70	66	4
Working Funds, Federal Security Agency			[1] 74			
			[2] 218	292	54	238

[1] Repayments for services.
[2] Prior year unobligated balances.
[3] Represents an adjustment in 1948 expenditures.

Table 2.—*Commissioned officers and civil-service personnel as of June 30, 1950*

Organization	Full-time						Part-time (civilian)			
	Grand total	Commissioned officers	Civilian				Total	When actually employed	Without compensation	Other
			Total	District of Columbia area	States	Outside United States				
Public Health Service	16,295	[1] 2,152	14,143	1,742	12,110	291	4,764	458	[2] 4,017	289
Office of the Surgeon General	752	71	681	632	46	3	13	11		2
Immediate Office of the Surgeon General	45	9	36	35	1		1	1		
Division of Commissioned Officers	80	12	68	65	3		1	1		
Division of Finance	169		169	169						
Division of International Health	77	39	38	31	4	3				
Division of Management Services	104		104	104						
Division of Personnel	85	1	84	84			1			1
Division of Public Health Methods	103	2	101	96	5		9	9		
Division of Supply	64	3	61	43	18					
Details to other agencies	25	5	20	5	15		1			1
Bureau of Medical Services	8,982	1,108	7,874	264	7,435	175	448	197	26	225
Immediate Office of the Chief	13	7	6	3	3		2	1		1
Division of Administrative Management	87	1	86	79	7					
Division of Dental Resources	15	7	8	8						
Division of Foreign Quarantine	643	52	591	23	479	89	25	4	8	13
Division of Hospital Facilities	132	12	120	74	46		5	4		1
Division of Hospitals	7,619	862	6,757	43	6,628	86	402	183	14	205
Division of Medical and Hospital Resources	24	9	15	15						
Division of Nursing Resources	20	5	15	14	1		5	5		
Details to other agencies	429	153	276	5	271		9		4	5
Bureau of State Services	4,188	701	3,487	846	2,531	110	4,204	186	3,977	41
Immediate Office of the Chief	18	5	13	11	2					
Division of Administrative Management	78		78	76	2					
Division of Chronic Disease	167	53	114	41	73		38	31	6	1
Communicable Disease Center	1,568	196	1,372		1,355	17	29		15	14
Division of Dental Public Health	115	43	72	16	53	3	3	2		1
Division of Engineering Resources	25	11	14	13	1		3	3		
Environmental Health Center	160	38	122		122					
Division of Industrial Hygiene	93	40	53	33	20		5		5	
Division of Public Health Education	27	3	24	16	8					

Division of Public Health Nursing	45	41	4	4						
Division of Sanitation	114	61	53	24	29					
Division of State Grants	68	15	53	51	2					
Division of Tuberculosis	407	69	338	190	145	3	106	104	2	
Division of Venereal Disease	580	66	514	121	393		68	3	45	20
National Office of Vital Statistics	230		230	228	1	1	3,936	35	[2] 3,901	
Division of Water Pollution Control	106	28	78	22	56		8	8		
Regional Offices, Alaska and Philippine	384	29	355		269	86	8		3	5
Details to other agencies	3	3								
National Institutes of Health	2,373	272	2,101		2,088	3	99	64	14	21
Immediate Office of the Director	11	2	9		9		2		2	
Office of the Director	605	5	600		600		1			1
Experimental Biology and Medicine Institute	277	50	227		227		13	10	1	2
Microbiological Institute	406	62	344		341	3	8	5	1	2
National Cancer Institute	610	65	545		545		17	11	3	3
National Heart Institute	177	29	148		148		24	22		2
National Institute of Dental Research	38	10	28		28		4	2		2
National Institute of Mental Health	143	45	98		98		22	13	7	2
Research Grants and Fellowships	106	4	102		102		8	1		7

[1] Includes 1,185 Regular officers and 967 Reserve officers.
[2] Includes 3,901 collaborating epidemiologists and special agents.

Building almost completed. Plans were being made for such auxiliary services as emergency electrical power, fire protection, and housing of the Center's future employees. Studies of such engineering problems as sanitation and safety were in progress.

Organization, personnel planning, and development of procedures for the care of patients will now go forward rapidly—all leading to the completion of the Center late in 1952 and the reception of patients early in 1953. The patients will be selected from persons who have diseases under study at the National Institutes of Health and who are referred to the Center by their physicians. The majority of beds will be allotted to the study of long-term illnesses, such as cancer, heart diseases, mental and nervous diseases.

THE ISOTOPE LABORATORY

The Isotope Laboratory was completed and officially opened in June 1950. It is one of the few radio-isotope laboratories in America designed solely for medical research.

Radioactive isotopes have provided powerful research and therapeutic tools for all branches of biology and medicine. Small quantities of these isotopes can be incorporated into drugs, foods, antibiotics, and many other materials of biological interest and can be used to study the fate and the action of the "labelled" substance in experimental animals. Larger amounts of radioactive isotopes can be used to study the effects of radiation on the body. Large doses of isotopes appear to offer some promise in curing disease through the destructive action of the emitted radiations. But much research remains to be done.

Investigations now under way at the National Institutes of Health cover a wide variety of fields and involve familiar isotopes such as carbon, phosphorus, and iodine as well as some relatively rare members of the radium and thorium family. These studies are conducted chiefly by the Laboratory of Physical Biology of the Experimental Biology and Medicine Institute. The Isotope Laboratory was constructed to provide increased facilities for working with relatively large amounts of radioactive materials under conditions assuring the greatest safety to human beings and the greatest accuracy of scientific investigation.

Procedures were established for the safe handling of radioactive isotopes. A monitoring system for protecting the entire staff of the National Institutes of Health was put into effect, thus assuring both the safety and the accuracy of investigations into the biological effects of high energy radiation.

Much of the Isotope Laboratory's design and construction is experimental; it is so built as to allow the addition of new equipment or replacement of old equipment with the development of new materials

and techniques. In this sense, the Laboratory will condition the future construction and equipping of the Clinical Center's own radiation wing, and the construction of other such laboratories throughout the country.

Experimental Biology and Medicine

Among the more important research accomplishments in experimental biology and medicine was the discovery of a new series of pain-relieving drugs which offer considerable promise as substitutes for morphine. These new drugs have potential value in efforts to solve the problem of drug addiction. In another field, a new method has been under investigation by which histamine is detoxified in the body. Histamine is thought to be involved in producing allergic reactions such as asthma, hay fever, and hives. Findings point to new knowledge of how the body handles histamine and new ways to control the metabolism of the substance.

In collaboration with the Department of Agriculture, the Public Health Service sent an expedition to Africa to collect seeds and plants of several species of strophanthus, reported to be a potential source of cortisone. Preliminary reports on these specimens are discouraging. Strophanthus probably will not be a practical source of cortisone, but the search for a suitable plant source will be continued.

In the field of nutrition, studies related to peptic ulcers showed that pyridoxine (vitamin B_6) deficiency reduced gastric secretion. Rats receiving a purified diet showed a marked decrease in gastric secretions with age when compared with rats receiving diets containing natural products. This investigation is in the direction of determining what substances in food and what properties of food may prevent ulcers.

Another nutritional study indicated that copper is a necessary dietary element for normal hair growth and color in black rats; and that a copper deficiency in diet may be partially responsible for graying hair.

Although it is well known that insulin will control diabetes, the causes of diabetes are not yet known. Scientists of the Public Health Service showed that diabetes in animals is not entirely a deficiency of insulin. They produced diabetes in rats with normal insulin secretion simply by using an excess of certain pituitary hormones, either the growth hormones or ACTH. They found also that the nervous system has a profound influence on the ability of an animal to utilize sugar, a primary defect in the metabolism of patients with diabetes.

Scientists of the Public Health Service designed a special plate holder by means of which photographs from a V–2 rocket 100 miles above the earth were made of a cosmic ray smashing an atom to bits.

Research into the use of salt solution as an emergency treatment for surgical shock was completed in the laboratory with conclusive evidence that extensive clinical application of these findings is warranted. Steps have been taken in this direction within the Public Health Service, through the Marine Hospitals and research grants programs.

Microbiological Research

Scientists of the Public Health Service engaged in the study of infectious diseases found that aureomycin is the first drug or antibiotic having specific curative effects on whooping cough. Aureomycin can be given by mouth, and hence children with whooping cough can receive the new treatment at home. Such treatment will shorten the period of communicability.

The need for more knowledge on different groups of influenza virus and their relationships was demonstrated by finding commercial vaccines ineffective against two groups of influenza virus. Control of epidemics is limited until such knowledge is available.

Ultraviolet radiation was proved ineffective against spirochetes in whole blood. Although effective in the case of plasma, ultraviolet radiation will not destroy spirochetes in blood freshly drawn from infectious syphilitic donors. These findings are of major importance to the National Blood Program.

A standardized test has been developed for brucellosis (undulant fever); it will be useful in comparing the effectiveness of various therapeutic agents. To date, a combination of streptomycin and aureomycin has proved to be the most effective treatment for this disease. Advances have been made toward developing an effective immunization agent against brucella infections.

For the first time it has been demonstrated that tularemia (rabbit fever) can occur from the drinking of contaminated household water. This suggests that local water supplies in areas with no purification facilities may constitute a serious public health menace.

It has been found that cattle can acquire infection by breathing the causative organism of Q fever. Cows thus infected infect their calves. This knowledge broadens the basis for epidemiological understanding of Q fever in cattle. Moreover, it suggests that brucellosis in cattle may be spread in the same way.

Field trials proved the effectiveness of six compounds that will kill snails native to the United States and elsewhere which might be intermediate hosts of schistosomiasis.

Terramycin was found to be the drug of choice in the treatment of amebic dysentery in human beings.

National Cancer Program

Even though understanding of the cause and nature of cancer is growing rapidly, knowledge of the disease is not yet sufficient to indicate with certainty the sources from which will come methods of prevention and more effective means of treatment. The National Cancer Institute, established to mobilize and give direction to the Nation's efforts in this field, continued to pursue its objectives through three broad programs: intramural research, research fellowships and grants to outside institutions, and cancer control projects.

Without slackening the pace at which fundamental research is being conducted, the National Cancer Program began to concentrate funds and resources upon clinical research in order to speed up the application of medical knowledge. The number of grants approved by the National Advisory Cancer Council to support fundamental and clinical research in outside institutions increased again this year. A detailed analysis is being made to classify the kinds of studies in specific fields which are being undertaken at the present time. It is expected that this analysis will guide the Council in the future as to the fields in which additional research is needed.

INTRAMURAL RESEARCH

The thymus gland was found to have a significant connection with the occurrence of leukemia. Using young mice of a strain that usually dies of spontaneous leukemia, investigators showed that total removal of the thymus prevented leukemia in most of the animals.

In an effort to find differences that would lead to improved methods of diagnosis or treatment, enzyme studies of normal and malignant tissue were directed toward a more detailed description of enzyme patterns. Cancer is less differentiated than normal tissues and, in certain respects, resembles the tissues of the normal embryo. This resemblance to the embryo may explain the rapidity of cancer growth.

As a means of studying the role of viruses and other cell particles in cancer, a new method of purifying and isolating these particles was developed. The method, a form of chromatography, uses a new type of absorbent material.

By feeding rats two forms of a cancer-producing chemical tagged with radio-active carbon, investigators were able to trace the course of the chemical and its products through the body. The new method traced and recovered the full amount of the chemical and its products. This work is expected to throw light on the role of chemicals in causing cancer.

It was found that systemic effects play an important part in the radiation of transplanted mouse lymphosarcomas. Irradiation of

the whole body of the mouse was found to cause profound regression of the tumor, with no recurrence of the tumor in a few cases. Studies of the mechanism of this systemic effect are expected to tell whether the effects of radiation injury on long-term survival are irreversible.

A 5-year search for chemical agents that destroy or damage cancer was concluded. Nearly 2,500 chemicals were tested, and about 125 were found to be damaging to cancers in experimental animals. Intensive studies of these 125 chemicals will now be conducted to determine which of them are suitable for use in clinical trials on cancer patients.

Children with lymphatic leukemia were treated with cortisone as part of the clinical investigations conducted by the Laboratory of Experimental Oncology in San Francisco. Although cortisone had little effect on the disease, it did improve the general condition of the patients. In this laboratory, unique methods for intra-arterial catheterization were devised and used; these techniques may have diagnostic uses, but they were developed as a means of delivering certain agents more directly to organs involved by Hodgkin's disease or other cancerous conditions.

CANCER GRANTS HELPED THESE SCIENTISTS

At Memorial Cancer Center, New York City, and Children's Medical Center, Boston, researchers aided by Public Health Service grants have found that the nitrogen mustards, folic acid antagonists, and other chemicals are partially successful in the treatment of acute leukemias, Hodgkin's disease, and lymphosarcoma. Many types of chemicals are being screened and tested for such uses at these two cancer research centers.

Fluoroscopy has been recognized for many years as an aid to diagnosis of internal disorders such as gastric cancer, but its use has been limited by the lack of clarity of the image. Another limiting factor has been the danger of excessive radiation from the X-ray beam. Aided by Public Health Service grants, the Johns Hopkins School of Medicine has been working to devise an instrument that gives more brilliance and clarity of image with lower intensification of radiation, thus causing less exposure of both patient and operator. A specialized camera constitutes a considerable advance in this direction. The research unit is developing a new device to permit almost instantaneous processing of films, so that physicians may look at the picture of the stomach almost as soon as it is taken. These devices will be useful in surveying the body for cancer.

Improved diagnosis and more precise location of brain tumors have been obtained at the University of Minnesota. A fluorescent dye is injected into the body. The dye becomes localized about the tumor and serves to define its boundaries. This is proving helpful as a guide to brain surgery.

The Department of Cancer Research at Michael Reese Hospital in Chicago has been investigating for a number of years the relationship between diet and cancer. A major contribution has been the demonstration that a diet low in calories retards the formation of many types of tumors in laboratory animals. Much of this work has been supported by Public Health Service grants.

CANCER CONTROL

A total of $3.5 million was expended for cancer control projects. Nearly one-third of the sum went to State and local health departments, hospitals, universities, and other non-Federal institutions. Educational projects supported by grants included special courses for physicians, nurses, and public health workers; training in exfoliative cytology; and the production of several motion pictures.

Two more films were completed in the professional training series being developed in cooperation with the American Cancer Society. A film for public education, "Challenge: Science Against Cancer," was produced in cooperation with the Canadian Department of National Health and Welfare.

National Heart Program

Steady progress was made against America's leading cause of death—diseases of the heart and circulation. A vast research effort, buttressed by the support of many agencies, public and private, is under way. The National Heart Institute provides leadership and coordination for the total Public Health Service heart program. Direct activities of the Institute are focused primarily on research and training, while control aspects of the program are administered by the Heart Disease Control Branch, Division of Chronic Disease, Bureau of State Services. During the past year, activities in research, training, and control—three areas of chief importance to the conquest of heart disease—were markedly expanded as effective facets of the National Heart Program.

The heart disease problem is exceedingly complex, embracing more than 20 diseases of the cardiovascular system. The greatest need at present is more knowledge of causes, additional methods of diagnosis and treatment, and new curative measures.

ADVANCES IN HEART RESEARCH

The development of a comprehensive research program was keyed to expansion when clinical facilities become available. Small research groups were established and facilities were equipped for conducting investigations on a diversity of theoretical and practical

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problems. Studies were made in chemical pharmacology, natural products, cardiovascular hemodynamics, kidney and electrolyte metabolism, general metabolism, and the technical development of diagnostic instruments. The central core of the clinical research program also was established, with investigations carried on in general medicine, experimental therapeutics, and in gerontology—the study of the aging process so closely related to heart disease.

Progress was made toward devising an improved anticoagulant to prolong the clotting time of blood. Drugs now employed in routine treatment of heart disease to prevent the enlargement of existing blood clots or the formation of new ones have often exhibited capricious behavior when used clinically. Moreover, treatment with these agents at present requires hospitalization and rather expensive laboratory control. Studies have clarified the basic limitations of these drugs and are proceeding toward development of better agents.

A significant accomplishment during the year was the development of a powerful new drug, procaine amide, as an effective treatment for irregular heart beat or palpitations. The drug acts quickly and, more important, it can be taken by mouth. Many lives may be saved by the use of procaine amide because it suppresses irregular heart rhythms, which often cause cases of coronary thrombosis to have a fatal outcome. This important research was made possible, in part, by the cooperation of a pharmaceutical firm. The new drug is already available to physicians.

Metabolic investigations on rats have demonstrated beyond reasonable doubt that the acute renal lesion resulting from choline deficiency is not due, as is commonly believed, to a simple disturbance of fat metabolism in the kidney and liver. This may be a clue to other factors in the causation of diseases of the kidney and liver.

Considerable progress was made in the technical development of instruments for diagnosis of diseases of the heart and blood vessels. These include devices to measure the pumping action of the heart, its effectiveness in terms of the volume of blood pumped, the state of vessel walls, and the rate of blood flow in the extremities.

Studies have been carried on to ascertain the effects of aging on muscle efficiency and work capacity. With such information, physicians will have a basis for estimating the amount of work and exercise that can be permitted elderly patients with varying degrees of heart failure.

Cooperative research units were established at several institutions to foster heart disease research, provide for training of investigators, and promote exchange of ideas, techniques, and personnel. Fifteen units were in operation at the University of California, University of Minne-

sota, Tulane University, and Massachusetts General Hospital. At least 51 percent of the expense was borne by these participating agencies.

HEART RESEARCH GRANTS HELPED THESE SCIENTISTS

Many promising investigations were conducted in all areas of heart disease by recipients of research grants from the Public Health Service. Studies of the effects of cortisone, ACTH, and other new drugs on rheumatic fever and rheumatic heart disease were among the new projects launched during the year.

One of the most important medical discoveries of the year was made possible in part by Public Health Service grants. Giant cholesterol-bearing molecules, not present in normal blood, were discovered in the blood of patients with atherosclerosis—a common type of arteriosclerosis. This discovery will have far-reaching results. It not only throws light on the cause of this baffling disease, but may also lead to simple tests for case-finding and to preventive or curative treatment.

Another remarkable achievement, aided by a Public Health Service grant, was made in vascular surgery. The surgeon who conducted this research succeeded in grafting pieces of blood vessels to reconstruct arteries after severe limb injuries. As a result, arterial blood flow was restored, greatly increasing the chances of saving the patient's limb as well as his life.

Dental Research

The National Institute of Dental Research has devoted much of its effort to investigation of the causes and control of the Nation's most prevalent disease—dental caries. Emphasis, however, is placed on basic problems underlying and contributing to pathologic conditions of the teeth and their supporting tissues.

Employing methods made possible by such advanced instruments as the electron microscope and the electron diffraction apparatus, investigators are progressing on studies of the structure and composition of the teeth and the influence thereupon of normal and experimentally produced environments.

Advances have been made in the field of oral bacteriology. Studies have been made in the identification and physiology of the oral microflora, and in the development of culture media for their isolation. The role of antibiotics and other inhibitory agents in controlling the biochemical activity of these microorganisms has been investigated.

FLUORIDE RESEARCH

Although it is known that the incidence of dental caries may be materially reduced by the topical application of fluorides or by the

ingestion of fluorides in the water supply, the physiological bases of these effects are not yet understood. The effects of various fluorides on the teeth and on the body as a whole are being studied. Much has already been learned about the distribution and fate of ingested fluorides. By means of experimentally induced caries in rats and hamsters, the effects of various nutritional factors are under study, as well as studies of agents which may inhibit or promote the development of caries.

Dental investigators of the Public Health Service are attempting to assess the value of supplementing communal water supplies with fluorides as a caries control measure. These studies were begun in 1945, and although it is far too early to draw any unqualified conclusions, preliminary results in Grand Rapids, Mich., are sufficiently encouraging to indicate that this may prove to be one of the most feasible methods for controlling caries on a mass basis.

DENTAL RESEARCH GRANTS

The research grants program of the Public Health Service stimulates the interest of dentists in dental research and enlists the aid of basic researchers in dental problems. Contributions from many fields of science will be needed for adequate promotion of research in the dental field, and the grants program is directed toward that end.

Some of the studies which have been made through dental research grants are contributing significant findings to the various fields of oral and dental science. One investigator has shown that there is no apparent relationship between the fluoride content of saliva and the oral lactobacilli count or the occurrence of dental caries. In a study of the mechanism of enamel solubility, with various reagents, stannous fluoride was shown to decrease to the greatest extent the solubility of enamel, dentin, and tricalcium phosphate.

National Mental Health Program

The program administered by the National Institute of Mental Health developed rapidly during the year, and gains were made in all three major sectors: research, aid to research and training, and community mental health services. Facilities for conducting research are still very limited, but some expansion was possible during the year. A small laboratory was established at the National Institutes of Health; the mental health center at Phoenix, Ariz., was reorganized as a research project; and research at the Public Health Service Hospital in Lexington, Ky., was increased.

One of the most important concerns of the Institute is the strengthening of social science research in the mental health field. Several

social scientists have been added to the staff, and a meeting of consultants in clinical psychology, sociology, and psychiatric social work was held during the year to discuss ways of developing this area of study.

RESEARCH FINDINGS

Studies of the addicting properties of drugs were continued at the Lexington Hospital. The most interesting results came from clinical trials of a new drug (d-alpha-acetylmethadol) as a substitute for morphine. This drug seems to be the most effective agent yet discovered for the treatment of morphine addiction, since no ill effects of abstinence can be observed when it is withdrawn.

Previous findings on chronic barbiturate intoxication were made public during the year through papers at professional and scientific meetings, articles, and a motion picture on the subject. The evidence that barbiturates have addicting properties aroused great interest and alerted the medical profession to the harmful effects of excessive use of barbiturate compounds.

Further data on the epidemiology of multiple sclerosis were compiled. The prevalence ratio in Winnipeg, Manitoba, was found to be over three times that in New Orleans, La. This evidence together with analysis of mortality data indicates that multiple sclerosis occurs more frequently in Canada (and probably in the Northern States) than in the South. Errors in coding and tabulating multiple sclerosis as a cause of death were found and, as a result, the National Office of Vital Statistics has altered its coding procedure so that more accurate and more complete data will be available in the future.

Studies were conducted on the possible relationship between multiple sclerosis and brucellosis. The findings did not support the theory that multiple sclerosis patients are unusually sensitive to brucellosis antigens.

Ten projects dealing with the phenomenon of spreading cortical depression and its relation to epilepsy and other convulsive disorders were completed during the year.

Research on community mental health programs and on public attitudes about mental illness and treatment facilities is in progress at the Phoenix, Ariz., Mental Health Center. A system for evaluating the project is being developed, with a view to helping other communities develop effective and economical mental health programs.

MENTAL HEALTH RESEARCH GRANTS

A special grant made possible the establishment of a Research Conference Group on Psychosurgery, which is to meet annually for 3 years to discuss the social, legal, and medical aspects of psychosurgery. Proceedings of the November 1949 meeting on Criteria for Selection

of Psychotic Patients for Psychosurgery have been published. The second meeting, held in June 1950, dealt with methods of determining and evaluating the degree of change in status of patients who have undergone psychosurgery.

Research grants are supporting a number of interesting studies in the mental health field. Emotional factors in physical illness are being found in studies of patients with diabetes, arthritis, colitis, hyperglycemia, and amenorrhea. In the search for aids to diagnosis, a study of urinary "pepsin" secretion has been demonstrated as an index of gastric activity in various emotional states. Studies of experimental neuroses in laboratory animals revealed important analogies to neuroses in human beings.

The roots of mental illness have also been sought in studies of preschool children who suffer from emotional difficulties. Another study of causal factors was made among survivors of concentration camps.

Improved methods of psychotherapy are the goal of another group of projects aided by Public Health Service grants. Social interrelationships in a mental hospital ward have been shown to have important bearing on the behavior and improvement of patients, and these relationships have been experimentally controlled. Another grant aided a study at the Orthogenic School of the University of Chicago where methods are being developed for treating children with serious emotional disorders.

Among studies that look toward the prevention of mental illness is a study of normal child development in a small community. To carry out this study, University of Kansas investigators have evolved many novel investigation techniques. Public Health Service grants have also aided the Yale University "rooming-in" project which pioneered in this widely discussed system of hospital maternity care.

COMMUNITY MENTAL HEALTH SERVICES

Many important achievements were accomplished through grants-in-aid to the States for mental health programs. In addition to approximately $3.3 million in grants, advisory services were supplied by 16 consultants stationed in regional offices, by the headquarters staff, and by members of the National Advisory Mental Health Council. Mental health needs were explored in such areas as education, children's services, vocational rehabilitation, alcoholism, and aging. Further research was done on mass screening techniques through a grant to the University of Illinois for the development of hypotheses and research designs to be used in later mass screening projects.

A Community Demonstration

The Mental Health Clinic of Prince Georges County, Maryland, is conducted as a demonstration of mental health services in a local

health department. Consultation and treatment were given during the year to 468 persons, 281 of whom were under 18 years of age. Community activities form an important part of the clinic's program. The aim is to stimulate community action to correct situations conducive to mental ill-health, wherever such conditions exist. Thus the Mental Health Clinic works with schools, courts, churches, parent-teacher associations, and other key groups.

All the States have completed their basic surveys of mental health facilities, eleven having been made in the fiscal year. The data from these surveys form the basis for planning State programs and in the future will be the base-line for determining progress.

MENTAL HOSPITALS

During the year, special surveys of State mental hospitals were made at the request of Maryland, North Carolina, Florida, California, Texas, Arizona, Utah, New Mexico, and South Carolina. These reports were used in the drafting of State legislation which has led to improved hospital services in most of the surveyed States.

The 1948 Census of Patients in Mental Institutions was published, the first since this activity was transferred from the Department of Commerce. By June 30, 1950, the returns from the 1949 census were being tabulated. Analysis of the 1948 data shows that State mental hospitals cared for about 95 percent of the resident patient population in all non-Federal hospitals for the mentally ill. The average daily patient census in State institutions was 463,496 in 1948, or about 3 per 1,000 population. Schizophrenia, cerebral arteriosclerosis, and senility accounted for the largest number of first admissions.

A film on parent-child relationships, "Preface to a Life," was produced during the year in cooperation with the Office of Education. Mental health staff members of the Public Health Service gave consultation to the National Security Resources Board on the psychiatric aspects of civil defense. The Assistant Director of the National Institute of Mental Health served full-time for the major part of the year on the fact-finding staff of the Midcentury White House Conference on Children and Youth.

Research Grants and Fellowships

The purpose of the Public Health Service Research Grants Program is to support research in medical and allied fields for which funds are inadequate or which could not otherwise be conducted in the grantee institution. The major objectives of the grants program are: (1) to expand research activities in universities and other institutions; (2) to stimulate the initiation of research in small colleges where previous research programs have been very limited or non-

existent; (3) to encourage investigators to undertake research in neglected areas; and (4) to provide training for scientific personnel. (See Training of Personnel under section on Health Resources.)

RESEARCH GRANTS IN 1950

On the recommendations of its five National Advisory Councils, the Public Health Service in 1950 made 1,556 research grants, totaling $14.2 million, as compared with 1,091 grants in 1949, totaling $10.8 million. These gains represent the great impetus given to medical research by the interest and concern of the American people.

The distribution of the grants and funds in 1950 was as follows: general medical, public health, and basic sciences—713 grants totaling $6 million; cancer grants—355 grants totaling $3.4 million; cardiovascular research—388 grants totaling $4 million; dental research—34 grants totaling $200,300; and mental health research—67 grants totaling $805,000. The major gains were in the categorical research programs, especially in cardiovascular research.

Existing laboratories are extremely crowded. Expansion of cancer and cardiovascular research would have been impossible without additional research facilities in many parts of the country. The Public Health Service made grants totaling $6 million to 28 institutions in 18 States and the District of Columbia for the construction of cancer research facilities. Grants for cardiovascular facilities totaled $6 million to 26 institutions in 17 States.

IMPROVING THE RESEARCH GRANTS PROGRAM

For the first time since the program was established, all five of the National Advisory Councils met together to discuss the development of long-range programs for the advancement of the medical and allied research fields. Many policy questions requiring uniform action by all Councils were raised and joint decisions were reached.

The vast volume of requests for research grants has required the establishment of a priority system for determining payment of approved grants. This priority system was established in order to permit all new applicants to compete for funds on an equal basis, and to ensure quicker response to and action on the applicants' requests. Since this priority scheme covers future years of commitment as well as the current year, it provides assurance to grantees in the form of a moral commitment that such funds will be provided as long as appropriations are available.

The rapid growth of the research grants programs of the National Heart Institute and the National Cancer Institute has for a long time indicated a need for effecting a reorganization of the Study Sections which would permit more adequate review of all applications submitted to the Public Health Service. Therefore, early in the year,

after careful consideration of the needs of the Institutes and with due regard for the work load of the Sections, the following reorganization was adopted. The Antibiotics, Gerontology, Radiobiology, Syphilis, and Tuberculosis Study Sections were disbanded. A new Section on Tropical Medicine was established by combining the Tropical Diseases and Malaria Study Sections. Three entirely new Study Sections—Arthritis and Rheumatism, Morphology and Genetics, and Experimental Therapeutics—were established.

RESEARCH ON CORTISONE AND ACTH

The rapid expansion of work with hormones caused the Public Health Service to establish an interim committee from the National Advisory Health, Cancer, and Heart Councils in order to review and recommend appropriate action on applications for ACTH and cortisone. The future role of the Public Health Service in the field of ACTH-cortisone research has been given a considerable boost. The interim subcommittee was continued throughout the year to expedite action on requests for these two drugs. The work of this committee is essentially over; however, the advice of its members is sought in cases of emergency. Generally, it may be said that applications for support in the ACTH-cortisone field will now be reviewed by appropriate Study Sections and Councils, as are all other applications.

Increasing Our Health Resources

Several programs of the Public Health Service contribute directly to the Nation's needs for health resources. The primary needs are for health personnel and for adequate hospital and health facilities.

The United States has already made good progress in adding to the supply of hospitals and health centers, through Federal grants to the States for planning and construction. No general plan of Federal aid to medical education has been adopted, however, so as to enable our educational institutions to produce more physicians, dentists, nurses, and public health specialists. On the other hand, some progress is being made in adding to the supply of certain groups of health personnel who need postgraduate study to complete their training.

Besides training additional numbers of men and women in the major professional groups, there are other ways of meeting the needs for health personnel. One is to develop more efficient ways of using the services of our highly trained professional workers. Another way is to make sure that health personnel are kept up-to-date in their fields and are prepared for future developments.

The Public Health Service is helping many State and local professional groups develop such methods. The Service is also conducting

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training programs for its own professional personnel. Moreover, the hospitals of the Public Health Service, its medical care programs for its beneficiaries, its quarantine service, and its cooperation with other Federal agencies all are part of the Nation's health resources.

Hospital Planning and Construction

The National Hospital Program has now been in operation for three years. It has brought about a comprehensive and dynamic plan showing the location and size of hospital facilities which are needed in each State. For the first time a definite plan is being followed by each State in determining the location, size, and type of facility which can best meet the hospital and health center needs of the people.

Hospital construction plans prepared by each State agency and approved by the Public Health Service have been extremely valuable in stimulating local communities to construct hospitals and health centers. In addition, the program has resulted in the enactment of hospital licensure laws in many States where none existed before. The impact of the program on modern design and construction has been gratifying, since both hospitals built under the program and those built without Federal aid are influenced by the new concepts. Improved services to patients have likewise resulted from better planned and designed hospitals.

GAINS IN 1950

Striking advances were made during the year in the construction of facilities. A year ago, slightly less than 800 projects had been approved; only 35 were in operation; 355 were under construction. The entire program, as then approved, would have provided approximately 38,000 hospital beds and 113 health centers. By June 30, 1950, 1,300 projects had been approved; 300 were in operation; and 500 of the remainder were under construction. When all are completed, the Nation will have 65,000 additional hospital beds and 250 new health centers. The total program at the close of the year represented an expenditure of nearly $1 billion, toward which the Federal contribution will be about $345 million.

In general, hospitals are being built first where they are needed most, and usually this means in areas of lowest income. General hospital projects predominate. Eighty percent of the total beds added to date are in such facilities. About one-half of the general hospital projects are new, nearly all of them located in towns of less than 10,000 population. These are typically small hospitals of 50 beds or less.

Increasing attention is being given to other kinds of hospital facilities, particularly chronic disease, tuberculosis, and psychiatric units in

general hospitals, and to public health centers. Four States now have extensive programs for health centers, and other States are beginning to develop such programs.

A CHANCE TO FORGE AHEAD

The Hospital Survey and Construction Act was amended in October 1949 to authorize $150 million to be appropriated for each fiscal year beginning with 1950, and to provide a minimum allotment of $200,000 instead of $100,000 for each State. In addition, each State was given discretion in establishing the percentage of Federal participation in each project.

A State may select a uniform percentage of Federal participation which is applicable to all its projects. A uniform percentage may not be less than 33⅓ percent or more than the allotment percentage or 66⅔ percent, whichever is less. The allotment percentage is determined by a formula contained in the act, as amended, and is based on the per capita income of the State in relation to the national average per capita income.

The State may adopt an alternative, providing a variable percentage of Federal participation (from 33⅓ percent to 66⅔ percent) based on the economic status and relative need for hospital facilities of the various areas. Under this alternative, a different percentage of Federal participation is applicable to each project or class of projects within the State. These new provisions allow greater flexibility in the application of Federal aid to hospital construction than was possible under the original law, which restricted the Federal contribution to one-third of the construction costs of each project.

Problems of Manpower and Education

The Public Health Service has been concerned for many years with problems of supply and distribution of health personnel in the United States. These problems are of especial importance when, as in June 1950, the prospects of military expansion indicate that large numbers of physicians, dentists, nurses, and medical and hospital technicians may be withdrawn from civilian occupations.

PERSONNEL IN THE DEFENSE PROGRAM

In response to a request from the National Security Resources Board, the Public Health Methods Division has made preliminary estimates of the minimum number of physicians, dentists, registered professional nurses, sanitary engineers, pharmacists, and veterinarians required for civilian health, as compared with the number of active personnel available in these categories. Studies of experience in the

United States and in other countries during World War II are in process, as well as studies of the distribution and utilization of existing health personnel and facilities.

A pilot study, sponsored by the National Security Resources Board, has been undertaken in conjunction with the Graduate School of Public Health, University of Pittsburgh, and the Allegheny County Medical Society. Conducted in the Pittsburgh area, the study will obtain information necessary to develop criteria for formulating Nation-wide plans and quotas for withdrawal of civilian physicians in time of war, based on medical service areas and minimum civilian requirements of an industrial center.

A survey will be made of all physicians in the Pittsburgh area to determine their current and maximum patient loads, the residence of their patients, and the general types of conditions for which patients are being referred to hospitals or other physicians. Analogous information will be obtained in a survey of hospitals. A house-to-house survey of a sample of the population of the area will determine illness experience and sources of services from physicians and hospitals. The time schedule for the study calls for completion of field work, analysis of returns, and the final report by July 1951.

STUDIES OF MEDICAL AND HOSPITAL SERVICE

Studies of medical and hospital service by the Public Health Methods staff continue to provide the largest volume of Nation-wide data on these subjects. During 1950, the sixth and seventh reports were added to the series on group medical practice. The sixth, on the income of physicians in group practice, showed an increase in income with increase in age and years of practice.

The seventh report analyzed the services rendered to new patients of 16 medical groups, covering the frequency of complaints and diagnoses, the number of visits, the types of examinations, and forms of treatment prescribed. The types of service rendered varied with the training and experience of the physicians. This finding suggests the possibility of relating the training of physicians more closely to the pattern of medical services required by patients.

Various other important publications have been educed from this study of group medical practice which was begun in 1946. Among these, a chapter in a volume to be published by the Brookings Institution provides data on 368 medical groups surveyed in 1946 and 91 additional groups identified later. The Directory of Medical Groups in the United States, first issued in 1946, was reissued in December 1949. The new edition contains information on medical groups in the United States and Canada reported to the Public Health Service since 1946.

The Public Health Methods staff also has conducted a study, under the sponsorship of the Medical Society of the District of Columbia, on the costs of hospitalized illness. The study provides information on the components of the costs of illness severe enough to require hospitalization, the relation of these costs to family income, the family's plans for meeting these costs, the extent to which voluntary insurance plans help in financing the medical and hospital charges, and the loss of earnings suffered.

Committee on Medical Service Programs

Problems of coordinating health and welfare activities to combat the physical, mental, and economic hazards of illness are in the forefront of attention. The Public Health Service has taken an active part in the work of Federal Security Agency groups to further that coordination and has set up a Committee on Medical Service Programs in its own organization.

Medical and Hospital Resources

Amendments to the Hospital Survey and Construction Act in 1949 (Section 636 of Public Law 380, 81st Congress), authorized two approaches to meeting problems in the hospital and related fields. First, the Public Health Service was authorized to conduct research, experiments, and demonstrations relating to the effective development and utilization of hospital services, facilities, and resources; second, grants to outside organizations were authorized for similar activities, including coordination.

Although funds have not been available for grants for hospital research and demonstrations, policies have been formulated and information has been given to prospective applicants. Application forms were approved and distributed and procedures established for the review of applications. A study group was set up and held its first meeting May 31–June 1, 1950. It is interesting to note that at this time 53 applications for grants had been received. A total of $2.6 million was requested for a wide variety of projects—most of them looking toward greater regional coordination of hospitals and services.

The Medical and Hospital Resources Division has made several studies in these fields and has assisted other groups in developing data. Reports were published on Tuberculosis Hospital Planning; Hospital Construction and High Priority Areas; Hospital Construction Under the Hill-Burton Program: An Analysis of the Type, Size, and Location of Projects; and Elements of Hospital Operation. The Division conducted four regional institutes on problems of opening new hospitals constructed under the Hill-Burton Act.

Dental Resources

One of the most important factors in oral health for the Nation is the availability of effective manpower. During the year, the Dental Resources Division pointed up the manpower situation in terms of the availability and effectiveness of dentists, dental hygienists, dental assistants, dental technicians, and other persons engaged in oral health activities. Efforts were made to gain information on the needs for dental care among various population groups, including Public Health Service beneficiaries.

Early in 1950, the Public Health Service, in cooperation with the Council on Dental Education of the American Dental Association, and the American Association of Dental Schools, planned a study of the financial status, faculty structure, and present and proposed facilities (academic and research) in the dental schools of the United States.

Recognizing the need for developing more efficient methods and procedures in dental care, the Public Health Service has initiated a project in which auxiliary dental personnel perform an important function. This project is intended to augment the efficiency of the clinical operator through training and use of chair-side assistants, and adaptation of newly developed techniques (technical and administrative). The project is divided into two sections: one at the U. S. Merchant Marine Academy, Kings Point, N. Y., and the other at the U. S. Marine Hospital, Norfolk, Va. There are certain factors inherent in each of the populations served at these sites. It is anticipated that this project will enable the Service to improve its clinical care operations.

Nursing Resources

The high rate of withdrawal from schools of nursing, the understaffed hospitals, the waste of nurse power due to inefficient assignment of hospital personnel, the low standards of curricula in a high percentage of nursing schools—call for constructive leadership. The long-continued, Nation-wide shortage of nursing service is being attacked in various ways. One of the most effective is the conduct of State nursing surveys, which aim to define the problem within the State, discover ways to improve the resources for nursing education, and stimulate the communities on a State-wide basis to solve the problems delineated.

NURSING SURVEYS

During the year, the Nursing Resources Division of the Public Health Service assisted in eight surveys in Tennessee, Illinois, South

Dakota, South Carolina, Washington, Louisiana, New Jersey, and Arizona. Requests for like assistance were received from five other States.

The State nursing surveys have led to many concrete results. In some cases, many small, inadequate schools have been combined to make fewer and better schools. Several States have provided psychiatric and tuberculosis training for student nurses. Others have made detailed studies of the costs of nursing education. In every State, some kind of council or committee is now putting into effect the recommendations of the survey.

A survey of six nursing schools located in Massachusetts, Maryland, and Michigan was made at the request of a religious order. Three of the schools are now combining into one central school.

Five hospitals in Alabama have organized a central educational program at the University of Alabama, to start in the fall of 1950. In Mississippi, where a survey was undertaken in 1948, three small schools of nursing combined in 1950 to form one central educational program under the auspices of a junior college, and the legislature increased appropriations for a central school of nursing at the University of Mississippi.

NEW STANDARDS—BETTER SERVICE

General standards to measure the adequacy of nursing service have been developed by the nursing and hospital organizations from studies of "best current practice" or "opinion of need". Widespread use of these standards in hospitals of all sizes all over the country has revealed their inadequacy.

Hospital administrators, members of the medical profession, nurses, and citizens who use nursing service are requesting more realistic and scientific approaches to measure the adequacy of nursing care. They want nursing functions analyzed and perhaps redistributed. Many hospital services which do not require nursing skills can be performed by less highly trained workers. This would make it possible for the nurses to do more nursing.

At the request of a New England hospital and a university school of nursing, the Nursing Resources staff collaborated in a detailed study of the functions of the head nurse. The technique evolved for this study is being refined by testing in a variety of situations. Later a manual or guide will be developed for self-study of nursing functions in any hospital. The results of this and other studies will be shared with the American Nurses Association Clearing House for Nursing Research.

Use of a common method, as described in the forthcoming manual, will enable hospitals to compare data and to set a pattern for better patient care. Better job descriptions will result in a clearer delinea-

tion of each person's functions. More effective use of nursing skills of both professional and nonprofessional workers will bring better care to the patient without increasing the numbers of workers.

Engineering Resources

Engineering is at the core of many public health activities, particularly in the environmental health field. One of the important responsibilities of the Public Health Service is to offer leadership and guidance in this aspect of its health programs. To this end and to serve as a focal point for information and advice on public health engineering, a new division was established in the Bureau of State Services in September 1949—the Division of Engineering Resources.

Gaps in knowledge about graduates of schools of sanitary engineering—how they are trained, where they work, and so on—were disclosed at a conference of educators and workers in this field early in 1950. The Public Health Service was asked to fill in these gaps by studies and surveys. Two surveys are now under way, one to determine the number of graduates from schools of sanitary engineering over a span of years and the other to learn the profession's "rate of loss." These studies are part of a larger effort to determine more clearly how many sanitary engineers are needed and where they can be used most effectively to improve the Nation's environmental health.

Two new areas of environmental health work are being studied: the hygiene of housing, and radiological health. State and local health departments received advice on housing codes and on the enforcement of minimum health standards for the maintenance, use, and occupancy of existing housing.

RADIOLOGICAL HEALTH

The first full year of effort in the radiological health field has witnessed the beginnings of training programs by Federal, State, and local agencies. New public attitudes toward radiation hazards are also becoming apparent, replacing both the lethargy that existed before 1945 and the unwarranted anxiety that characterized the early postwar years. People are beginning to face the prospect of high energy radiation with calmness rather than fear, secure in the belief that State and local agencies will be ready to deal with the hazards. If the agencies are to live up to that confidence, more systematic training in the public health aspects of radiation must be made available to Federal, State, and local workers.

The Public Health Service moved forward rapidly during the year in promoting research, information, and training in radiological health. It also provided consultative services to many governmental and nongovernmental agencies on radiation-producing machines and radioactive substances.

Training Health Personnel

The shortages of trained personnel in every field—research, medicine, and public health—have seriously handicapped the expansion of the health sciences and services. Several programs of the Public Health Service are helping to meet these shortages in various ways.

Research fellowships enable young scientists to obtain advanced training in the basic sciences and in various special fields. Traineeships for physicians and other personnel add to the Nation's supply of specialists in cancer, heart disease, and psychiatry. Special grants to medical and dental schools make it possible for these institutions to expand their undergraduate teaching programs in those subjects.

Grants to the States also enable health departments to send their personnel to graduate schools of public health and other institutions for special training. Through its Communicable Disease Center, the Public Health Service also provides field training for limited numbers of employees of State and local health agencies. Through internships and residencies in its own hospitals, the Public Health Service is also adding to the Nation's supply of physicians—for positions in governmental agencies, voluntary organizations, and private practice.

RESEARCH FELLOWSHIPS AND CLINICAL TRAINING

Closely related to the Public Health Service program of aid to research is the fellowships program administered by the National Institutes of Health. In addition to fellowships in the basic sciences and in general medical and public health fields, there are special programs for young scientists interested in cancer, cardiovascular, dental, and psychiatric research.

During the fiscal year 1950, the Public Health Service awarded 827 research fellowships: 527 in the general fields, 164 in cancer, 90 in heart disease, 16 in dental, and 30 in psychiatric research. As the general fellowships program has grown and developed during the past 5 years, the annual numbers of applicants have increased. For example, 1,576 applications for fellowships in general fields were received in 1950, as compared with 742 in 1949.

The Boards charged with the responsibility for reviewing applications unanimously agree that the qualifications of applicants for Public Health Service fellowships have increased with the increase in numbers. A significant trend has been observed also in a gradual increase in the numbers of applicants for fellowships in clinical research, such as ophthalmology, otolaryngology, obstetrics, and gynecology.

Aid to Clinical Training

The cancer, heart disease, and mental health programs also provide traineeships for professional personnel, as well as grants to educational

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institutions for the expansion of their basic teaching programs in those special fields. In 1950, 755 individuals were taking advanced training with financial assistance from the Public Health Service. Approximately $1.4 million was expended for this purpose.

The Nation's 77 accredited medical schools and 33 dental schools participated in the cancer education program, receiving approximately $2.1 million to strengthen their undergraduate cancer teaching. Forty-seven medical schools received similar grants for teaching in the cardiovascular field. In the cancer control program, special short courses for physicians, nurses, and public health workers were supported by grants.

The mental health program differs somewhat from that of the other two specialized programs of aid to medical education. Grants to 44 medical schools in 1950 enabled them to develop new and expanding programs in psychiatry for undergraduate students. Graduate training in psychiatry, clinical psychology, and psychiatric nursing and social work is provided both by grants to institutions (141 in 1950) and by stipends to graduate students. In 1950, 467 persons were receiving graduate training through the Public Health Service.

Special training grants were also made available to the American Psychological Association, the American Association of Psychiatric Social Workers, and the National Organization for Public Health Nursing. This aid enabled these professional societies to sponsor conferences for orienting personnel in their fields. Five mental health institutes for public health personnel were conducted in different sections of the country. The institutes were financed by Public Health Service grants but were conducted by medical schools and State mental health authorities.

Committee on Medical School Grants and Finances

The work of the Surgeon General's Committee on Medical School Grants and Finances was completed in 1950, and a preliminary report has been published, one of the four in preparation. The survey on which the report was based had been conducted by the Public Health Methods Division during the preceding year.

The preliminary report, "Financial Status and Needs of Medical Schools," presents a wealth of data, including 67 tables, on the schools' sources of income, expenses, deficits, staff vacancies, and the deans' estimates of current and prospective needs. The opinions and comments of the deans are summarized in this report. They cited their staff needs, the curtailments in program resulting from shortages of staff and funds, and their estimates of costs of improvements in both plant and operations, if they are to maintain standards with present and increased enrollment.

A report on the impact of the Public Health Service's research and training grants includes an analysis of the distribution of research grants among medical schools, in terms of the size, type of control, expenses, and full-time faculty of the schools. Opinions of the deans on the effects of grants on their programs and resources, as well as their suggestions for improvement, are summarized.

TRAINING OF PUBLIC HEALTH WORKERS

The Nation's expanding public health program calls for additional trained workers to serve in administrative and technical positions in a wide variety of organizations and programs. Federal, State, and local health agencies, voluntary organizations, school health programs, industrial establishments, and labor organizations are in the market for well-trained public health personnel.

The Public Health Service is accumulating information on the supply of trained public health workers in relation to the demand for their services, as well as on the facilities and output of the institutions that train these workers. As a first step, a survey of the graduate schools of public health has been started in cooperation with the Association of Schools of Public Health. Similar studies are planned for other groups of schools.

Public Health Service grants to the States for general and special health programs assist in the training of employees of State and local health agencies. Several States have established excellent recruitment and training programs. For the first time, the total staffs of State health departments rose above the 20,000 mark. The States also provided training for nearly 8,000 of their staff members in 1950, an increase of 1,500 over those in training in 1949.

At its Communicable Disease Center in Atlanta, the Public Health Service provided field training for 862 State and local health personnel. Of this group, 449 attended one or more of the 22 courses conducted at Atlanta and regional training centers, and about 413 others enrolled in short courses held in various sections of the country. More than 100 of the enrollees were from 45 foreign countries.

Almost every program in the Public Health Service participates in educational activities for professional groups, in cooperation with Federal, State, and local agencies, voluntary organizations, and institutions. In some instances, field training officers and teams are assigned at the request of official health agencies. In others, individual members of the staff assist in the conduct of seminars, institutes, and special courses for public health personnel.

TRAINING IN THE PUBLIC HEALTH SERVICE

The residency and internship programs of Public Health Service hospitals constitute a significant source of supply of trained medical

officers and other hospital personnel requiring specialized clinical knowledge. Fourteen of the hospitals have been approved for the training of physicians by the Council on Medical Education and Hospitals of the American Medical Association. Nine have the approval of the American Dental Association for teaching dental interns.

Nearly 1,000 senior students from Class A medical schools applied for internship appointments during the year. On July 1, 1950, the full quota of 122 medical and 32 dental interns reported for duty.

In their teaching programs, several of the hospitals cooperate with nearby hospitals, clinics, and medical schools. Public Health Service officers conduct classes and lectures and hold clinics for medical students in these institutions, whose professors and specialists in turn take part in the Service's residency programs. During the resident's period of instruction, about 80 percent of his time is devoted to direct patient care.

During the year, nearly 400 Public Health Service employees received orientation and training in a series of classes conducted by the Service. The courses included administration and public health work at the local, State, and Federal levels.

Officers of the Public Health Service participated in classes of instruction in radiological defense offered by other Federal agencies. During the year, 228 officers attended courses in the medical aspects of nuclear energy, and in atomic, biological, and chemical defense.

Hospitals and Medical Programs

The hospitals and medical care programs of the Public Health Service constitute an important segment of the Nation's total health resources. These services are made available to a long list of legal beneficiaries, of whom the largest groups are American seamen of the Merchant Marine, and officers and enlisted men of the United States Coast Guard. The services are administered by the Hospital Division, Bureau of Medical Services. In addition to providing care for its beneficiaries, the Public Health Service operates the national quarantine service and provides professional staff to other Federal agencies whose activities include medical and public health programs.

HOSPITALS OF THE PUBLIC HEALTH SERVICE

The hospitals of the Public Health Service number 24. They range in size from 30 to 1,400 beds. All but three have more than 100 beds. Most of these hospitals are in large shipping ports. The clinics and offices for out-patient care are in places where there are not enough beneficiaries to warrant operating a larger facility.

Since the enabling legislation, dated July 16, 1798, provided a medical care program for seamen, 22 of the hospitals are called U. S.

Marine Hospitals. These include 19 general hospitals, two tuberculosis sanatoria, and the National Leprosarium.

During the year, about 72,000 patients were admitted to the hospitals, an average of 196.3 per day. The average daily in-patient census for the fiscal year 1950 was 7,470. The number of visits to the out-patient stations totaled slightly more than 1 million.

Special Hospitals

Two sanatoria exclusively for tuberculous patients were operated at Neponsit, N. Y., and Fort Stanton, N. M. These hospitals reported 630 admissions, averaging 1.7 per day. The average daily census was 452.

Patients with Hansen's disease.—The patients at the National Leprosarium, officially the U. S. Marine Hospital, Carville, La., need specialized care for Hansen's disease as well as general hospital service. The same illnesses and injuries that befall the average citizen also occur among the men, women, and children at Carville. A group of consultants, in such fields as physical medicine, orthopedics, and psychiatry strengthen the resident staff.

The results of treatment with the sulfone drugs continued to be encouraging. Over 50 percent of the patients at Carville are now running negative tests. There is noticeable improvement in the condition of their skin. The average daily patient census for the year was 388.

Patients addicted to narcotic drugs.—The hospitals at Lexington, Ky., and Fort Worth, Tex., are known as U. S. Public Health Service Hospitals. Persons addicted to narcotic drugs and other neuropsychiatric patients who meet certain eligibility requirements prescribed by law are treated at these institutions. During the year these hospitals reported record population figures, reflecting increased voluntary admissions. About 6,300 patients were admitted to these hospitals, with an average daily admission rate of 17.4. The number of patients treated totaled 8,300.

Worthy of note is the Addicts Anonymous movement which originated in the Lexington hospital several years ago. Members hold regular meetings at the hospital and issue a monthly publication. Several chapters have been established by former patients in their home communities.

Clinical Research

Studies were carried forward during the year at many of the hospitals. These projects varied from formal investigations, carried out as special projects of the National Institutes of Health, to individual studies made by physicians who wished to find out the answers to certain questions related to care of their patients.

In all, about 150 clinical research projects were in progress during the year. These studies were concerned with many different illnesses and with the application of the newer discoveries, such as cortisone. At Carville, 13 new drugs were evaluated for possible effectiveness in Hansen's disease. Promacetin was found to be earlier in its effectiveness and less toxic than sulfones previously observed. Tibione, the new preparation developed in Germany during the war for the treatment of human tuberculosis, seems to be one of the most promising substances for further trial.

Obstetrical anesthesia research:—During the past two years in the Johns Hopkins Hospital and in the Sinai Hospital in Baltimore, Md., 7,124 women have been delivered with only one mortality among patients to whom an anesthetic was administered. This maternal death was not related to anesthesia. The infant mortality for this period, combining stillbirths and neonatal deaths in all infants who weighed above 1,000 grams, was 3.5 percent in the Johns Hopkins Hospital.

The program has succeeded in organizing a full-time department of anesthesiology in which at all times in both hospitals at least one physician and one special anesthesia nurse assistant have been on duty to manage pain relief and anesthesia for all patients during labor and delivery. Continued progress has been made in the development of various types of jet injectors with power spray mechanisms as substitutes for the needle and syringe.

Freedmen's Hospital

Freedmen's Hospital, Washington, D. C., has a total capacity of 511 beds and 34 bassinets, including an annex of 135 beds for tuberculosis patients. In 1950, the hospital operated at approximately the same level as during the previous year. There was no increase in bed capacity although the daily patient census ran somewhat higher. The number of births at Freedmen's average about 200 per month, or one-fourth of all deliveries of Negro mothers in the District of Columbia.

A total of 182 physicians and other hospital personnel received training during the year at Freedmen's Hospital. The hospital now has been approved by the American Medical Association for residencies in eleven specialties. In related professional departments, approval has been granted for training in medical technology, social service, and dietetics. The close cooperation between Freedmen's Hospital and Howard University continued throughout the year.

Eight committees advised on the hospital's procedures. These are the pharmacy and formulary committee, the intern committee, laboratory committee, program committee, medical records committee, tumor panel, poliomyelitis committee, and the executive committee.

A cardio-vascular laboratory was opened on May 7. The hospital published a formulary of drugs for the first time.

FEDERAL EMPLOYEE HEALTH

The Public Health Service provides professional and technical guidance to Federal agencies, upon request, in employee health services. It also operates health programs for certain Federal agencies, by contract, on a reimbursable basis and supervises the professional personnel of the health units of a few other agencies.

During 1950, approximately 46,000 Federal employees received such services from 22 health units and one infirmary. Seventy-one percent of these employees made 210,000 visits for treatment and health guidance. These figures represent an average of 4.5 visits per employee, and 6.4 per patient.

FOREIGN QUARANTINE SERVICE

Under a 1950 amendment to the Foreign Quarantine Regulations, ships or aircraft possessing a duplicate of pratique issued at any Canadian port will be exempt from inspection in the United States. Under Canadian regulations, ships and aircraft possessing a similar duplicate issued at any port in the continental United States, including Alaska, will be exempt from inspection in Canada. Formerly, this mutual agreement applied only to ships arriving at ports on the international waters between the United States and Canada.

A Manual for Medical Examination of Aliens was prepared for distribution to quarantine stations and to Public Health Service examination stations at United States consulates abroad. Copies will also be furnished to the Department of State for distribution to local physicians designated to examine visa applicants at all other United States consulates.

Foreign quarantine officers of the Public Health Service made 1.3 million examinations of foreign citizens seeking admission to the United States. Approximately 137,500 of the 227,000 persons examined in foreign countries were displaced persons. Of all the individuals examined in 1950, only 2,374 were certified as having diseases which exclude them under the law from admission to this country.

Excluding Epidemic Diseases

Arrangements were made for rapid diagnosis of smallpox at quarantine stations in the United States. Sterile kits for obtaining and mailing specimens were distributed to the stations. A laboratory of the Communicable Disease Center provides emergency diagnostic service.

During the year, a Mexican who had entered the United States illegally was found to have smallpox when he was examined as a

labor recruit. He was returned to Mexico in the custody of health authorities of that country. Smallpox was diagnosed in a United States citizen at the Laredo, Tex., station. The patient and contacts were placed in the custody of a local health officer, and the State health officer was notified.

Dockside boarding replaced boarding in the anchorage at three stations: Terminal Island, Calif., Charleston, S. C., and Galveston, Tex. This simplified operation is not feasible at ports such as New York, which have extensive dock areas.

MEDICAL SERVICES TO OTHER FEDERAL AGENCIES

The Public Health Service details officers to assist a number of Federal agencies in their medical programs. Within the Federal Security Agency, Public Health Service medical personnel are assigned to medical programs in the Social Security Administration (Bureau of Old-Age and Survivors Insurance) and the Office of Vocational Rehabilitation. Officers are also assigned to the Departments of State, Commerce, Labor, Treasury, Justice, and Interior.

Social Security Administration

Medical problems of other agencies, industrial establishments, and insurance companies, in determining whether permanent and total disability exists in an individual are the major concerns of the medical consultant to the old-age and survivors insurance program of the Social Security Administration.

Contacts were maintained with the Standard Oil Company of New Jersey, Consolidated Edison, the New York Workmen's Compensation Commission and with the medical directors of insurance companies, such as the Bankers Life, Continental Assurance, Connecticut Mutual, and Prudential of America. Discussions were held with several State health departments and representatives of leading universities concerning the possible part existing public health agencies might play in a disability insurance program.

Office of Vocational Rehabilitation

The medical phase of this program has been in operation for over 6 years, and State agencies are providing physical restoration services to an increasingly larger proportion of the clients. The need for medical guidance seems to be increasing instead of decreasing. This is due in part to newer concepts in the application of medical services to vocational rehabilitation, and in part to the need for better medical administrative procedures.

During the year, efforts were made to interest the American Dental Association in rehabilitation and to develop a better understanding by State agencies of dental disease as an employment handicap.

Amputee clinic teams have been developed in some areas, and guidance materials have been prepared for the establishment of rehabilitation centers for the more severely disabled persons.

Since vocational rehabilitation is a grant-in-aid program, its results are best demonstrated by the reports of progress from the State agencies. In 1946, of the 36,000 clients rehabilitated, a little more than 20 percent received medical service, in addition to the routine medical examination. In 1949, nearly 40 percent of the 58,000 rehabilitants received such services. Expenditures for physical restoration services have risen from 29 percent of all expenditures for services to clients in 1946 to 40 percent in 1949.

Foreign Service Personnel

The medical program was still expanding in 1950. New activities were added to those begun during 1949, and by the end of the year the program was substantially in full operation except for a few areas in which expansion was anticipated during the fiscal year 1951. Almost 4,000 medical examinations were ordered, the reports reviewed, and confidential health folders started on all American Foreign Service personnel.

Each Foreign Service post is now required to prepare a health and medical information sheet about health conditions at the post and give a copy to all new employees. Systematic policies and procedures for the use of Government hospitals, both overseas and in the United States, were developed and published.

Immunization requirements for service at various Foreign Service posts were established and procedures developed for the administration of immunization at Foreign Service posts at Government expense. Preemployment examinations of local employees were prescribed and procedures established. New health units were established during the year at Rome, Djakarta, Manila, and Teheran.

Maritime Administration

Medical activities consisted of providing medical and dental inpatient and out-patient treatments for enrollees of the U. S. Maritime Service and for cadet-midshipmen of the U. S. Merchant Marine Cadet Corps at field units of the Bureau of Maritime Services.

The medical and dental officers assisted in several training courses at the U. S. Merchant Marine Academy, the U. S. Merchant Marine Cadet School, the Hospital Corps School at the U. S. Maritime Service Training Station, and at the Alameda, Calif., Sheepshead Bay, N. Y., and St. Petersburg, Fla., training stations.

Health units in Washington, D. C., and New York City, and emergency rooms at eight of the U. S. Maritime Commission Reserve Fleets were operated under the supervision of the Chief Medical Officer.

Close liaison was maintained between the reserve fleets and the various divisions of the Public Health Service and State health departments in matters relating to sanitation, safety, and bacteriological surveys.

Bureau of Employees' Compensation

Medical care is provided to Federal civil employees for injuries sustained in performance of duty and for diseases attributable to conditions of employment. Arrangements are made for examination and treatment, including out-patient or hospital care. Orthopedic and prosthetic appliances and medical supplies are furnished as needed. The facilities of the U. S. Marine Hospitals, Public Health Service clinics, and, to a limited extent, medical installations of other Federal agencies are used.

Under the provisions of the Compensation Act, the Bureau has established a roster of designated physicians numbering approximately 4,000 private practitioners located throughout the country. These physicians may be called upon to render medical care to injured Federal employees in localities where governmental medical officers or hospitals are not available. From 20,000 to 25,000 cases are under consideration at all times.

Special studies are being made to determine the relationship of tuberculosis to the various levels of Government employment, with particular attention to occupational hazards encountered by employees in tuberculosis sanatoria and other medical installations. These studies are being made in cooperation with other Federal agencies operating programs for the care of tuberculosis patients.

Studies inaugurated some time ago in connection with industrial accidents and disease among workers of the Bureau of the Mint at Philadelphia and Denver were continued. Investigations have been made in Federal plants in which industrial health hazards have been reported, including the several Naval shipyards and Army industrial manufacturing plants.

In keeping with the provisions of recent legislation, the medical service is enlarging the scope of its rehabilitation activities. As in past years, the medical care program continues under direct supervision of the Bureau, whereas training is furnished through the several State vocational agencies. Pilot studies have been set up to explore the feasibility of rehabilitation services to be carried out while employees are receiving medical care in governmental hospitals. Such programs have been started at the U. S. Marine Hospitals in Baltimore and on Staten Island. For the time being, these programs will be confined largely to surgical patients in the orthopedic services, with a view to demonstrating the usefulness of early rehabilitation service.

U. S. Coast Guard

On June 30, 1950, 57 Public Health Service officers were on duty with the Coast Guard. They included 17 medical officers, 28 dental officers, 10 nurse officers, 1 scientist officer, and 1 sanitary engineer officer. Plans developed during 1950 will allow second-year residents from selected Marine Hospitals to serve a period of 6 weeks each during 1951, as medical officers on ocean weather stations when actually at sea. The plan would provide two medical officers for the west coast and four for the east coast.

Three complete new mobile dental units were in operation, serving personnel on duty in isolated areas where dental service is not readily available. Reports received so far from the dental officers indicate that the units are in all respects satisfactory. The officers have encountered no serious difficulties over the difficult terrain they must traverse in reaching isolated areas. The successful operation of these units will do much to improve the morale of the personnel in these areas.

Bureau of Prisons

For the past year the Public Health Service, as it has continued to do since passage of legislation in 1930, furnished medical, psychiatric, dental, and nursing services to institutions of the Bureau of Prisons. The relationship between the two services has continued to be excellent and much of the success in the medical program and other projects has been due to the splendid teamwork by the staffs.

The Bureau of Prisons cooperated with two medical investigators of Yale University, who are working with the Armed Forces Epidemiological Commission in carrying out a research project on infectious hepatitis at the Federal Correctional Institution, Danbury, Conn. Inmates participating in these projects were granted a reward in money and a reduction in length of sentence for their meritorious service.

One experiment was begun in November 1949, with six inmate volunteers who were inoculated by injection with two strains of the virus. Two inmates became infected and valuable information was obtained. The second experiment was started in March 1950. Nine inmates were inoculated on this occasion. This experiment was completed in June with none of the participants infected.

A central dental laboratory was opened this year at the Medical Center, Springfield, Ill. This laboratory is a project of Federal Prison Industries, and instruction and supervision are provided by a qualified technician employed by that organization. The purpose of the laboratory is to provide training for inmates in the manufacture of dental prosthesis. The training program requires a minimum of

one year for completion and provides instruction in the fabrication and repair of full and partial dentures.

Bureau of Indian Affairs

The Bureau of Indian Affairs is the one official agency, Federal, State, or local, which is given the responsibility of providing a complete health program, including both preventive and curative services, for an entire racial group. Comparative morbidity and mortality reports among Indians from decade to decade rather than from year to year show that considerable progress is being made in the improvement of the health of Indians. However, the efficiency of the Indian health program, as reflected in mortality rates, fluctuates from year to year in direct relation to professional personnel available to serve the Indians, and funds available to make possible the utilization of hospital and other facilities provided by the Government for the use of Indians.

Hospital and medical care: As of June 30, 1950, the Indian service was operating 163 hospitals varying in capacity from 10 to 420 beds. During the year one hospital unit of 200 beds was completed at Mt. Edgecumbe, Alaska, raising the total bed capacity in that institution from 220 to 420. Construction was started on a new hospital at Anchorage, Alaska, which is designed to have a total capacity of 400 beds, of which 300 will be for tuberculosis patients.

Legislation has been approved and funds requested in the 1951 budget to provide for the construction of a 200 bed hospital at Albuquerque, N. M. The hospital would be under the management of Bernalillo County, but priority would be granted the Bureau of Indian Affairs for 80 beds for the care of Indians. During the year, construction was started on a 100 bed wing to the Galen, Mont. Tuberculosis Hospital. When completed in 1951, this wing will be operated by the State of Montana on a per patient day cost basis, for the exclusive use of Indians.

Gains were made in the numbers of physicians and nurses employed during 1950. Dentists employed at the close of the year were 21 as compared with 19 on July 1, 1949.

Dental decay among Indians of all age groups, and particularly among Indian children, is one of the acute public health problems. In many of the northern tribes, an average of four cavities in permanent teeth per child of school age exists. To cope with this emergency, dental officers are placed on travel status and, as rapidly as possible, visit the various reservation schools and hospitals.

Health services: As a part of the Nation-wide fluoride demonstration project being conducted by the Public Health Service, a complete unit, consisting of two station wagons, portable dental equipment, a

dentist and a dental hygienist was made available for work among the Indians. The Bureau of Indian Affairs furnished an Indian clerk and two Indian technicians who are being trained by the dentist-in-charge.

The chest X-ray case finding program has been continued with two photo-fluorographic units in operation throughout the year and a third unit, in operation among the Navajos, about 6 months of the year. During the year 25,500 Indians were examined by these units and 510, not heretofore diagnosed, were found to have significant tuberculosis. There are approximately 2,400 tuberculous Indians needing hospitalization.

Definite progress was made in connection with sanitation among the Navajo population through the work of a sanitary engineer on full-time duty at that reservation. Two well-trained sanitarians have been added to the reservation staff, one for duty in the Shiprock, N. M., area and the other, a Navajo, for duty in the Chinle, Ariz., area. A sanitary engineer has been assigned by the Public Health Service full-time for the purpose of establishing within the Indian service a definite environmental sanitation program on a level commensurate with those of medical, nursing, and dental activities.

Expanding our Health Services

We have seen that medical science is advancing swiftly on many fronts. New knowledge is being uncovered and new techniques are being perfected. We have seen, also, encouraging progress toward our goals of providing adequate health resources—both manpower and facilities. But all these advances are sterile if they are not translated into prompt and effective action for improving health and controlling disease. The job of transferring knowledge into practice is done by many hands and many brains. Professional organizations, voluntary agencies and institutions, local, State, and Federal agencies all play a part.

Health services, like the education of our children, however, are primarily the concern of the local community. Health services must be provided closest to the area of need, so that the people who use the services may not only understand and support them but also be active partners in health planning and promotion. Because many local communities do not have the resources to provide complete health services, they must be aided by their State government. The Federal Government, although farthest removed from the local community, possesses the necessary resources and the technical competence to help the States bring health knowledge and protection to the citizens of every community.

Table 3.—*Approved projects in the National Hospital Program by type of facility and total construction costs, by State, June 30, 1950*

State	Total projects	Type of facility					Construction costs	
		General	Health center	Mental	Tuberculosis	Chronic	Total	Federal share
Total	1,369	1,047	211	63	37	11	$953,087,078	$344,246,543
Alabama	35	26	6	2	1		33,125,088	17,198,493
Arizona	9	9					8,542,089	2,887,461
Arkansas	28	22		6			17,634,922	8,223,168
California	38	35	1		1	1	28,642,798	8,738,157
Colorado	10	10					7,701,903	2,275,907
Connecticut	11	8	3				6,324,174	1,921,868
Delaware	4	3		1			2,287,702	822,650
District of Columbia	2	2					4,901,559	1,244,914
Florida	27	22	2	1	2		25,820,752	9,146,040
Georgia	70	42	28				24,505,746	10,660,211
Idaho	8	8					2,626,349	769,837
Illinois	25	23	1		1		29,138,539	9,430,464
Indiana	40	36	1	2	1		31,442,776	12,798,746
Iowa	31	31					18,608,482	5,658,479
Kansas	26	26					13,205,193	4,644,820
Kentucky	42	32		4	6		29,182,662	13,741,004
Louisiana	43	19	19	4	1		31,893,782	9,943,244
Maine	7	4		2		1	4,333,667	1,980,616
Maryland	11	9	2				10,857,674	2,979,499
Massachusetts	28	27	1				21,384,344	6,922,233
Michigan	31	29		1	1		28,313,352	10,404,434
Minnesota	32	28	2	1		1	31,827,693	9,018,820
Mississippi	102	48	51	1	2		29,757,543	15,250,275
Missouri	14	12	2				18,367,436	7,597,243
Montana	8	8					2,023,579	716,795
Nebraska	21	21					7,182,550	2,198,653
Nevada	3	2		1			928,785	233,846
New Hampshire	8	8					5,831,054	1,852,328
New Jersey	18	13		4		1	26,608,455	6,399,247
New Mexico	10	10					7,155,589	2,940,384
New York	56	56					47,395,862	14,230,351
North Carolina	61	52	2	5	1	1	31,698,914	11,495,427
North Dakota	9	9					2,464,169	894,366
Ohio	44	39			2	3	46,045,147	12,537,515
Oklahoma	42	35	3	3	1		14,756,814	6,050,634
Oregon	13	10	1	2			12,027,981	3,293,887
Pennsylvania	40	40					52,652,620	18,006,854
Rhode Island	9	8				1	8,205,780	2,243,012
South Carolina	101	25	61	9	6		28,767,870	14,459,167
South Dakota	10	9	1				2,998,878	1,067,637
Tennessee	29	19	4	2	3	1	25,256,739	9,828,536
Texas	85	75	5	1	3	1	59,345,541	21,959,440
Utah	7	6	1				3,442,768	1,295,797
Vermont	6	6					5,039,106	1,626,201
Virginia	26	18	8				22,641,396	8,228,616
Washington	19	17	2				15,589,921	3,423,710
West Virginia	13	2		8	3		9,250,018	3,083,340
Wisconsin	33	31	1	1			28,431,851	9,791,121
Wyoming	5	5					1,409,025	466,934
Alaska	1	1					599,076	199,692
Hawaii	2	1			1		4,362,046	666,434
Puerto Rico	14	8	3	2	1		20,519,374	10,780,172
Virgin Islands	2	2					29,945	17,864

Table 4.—*Payments to States, fiscal year 1950*

[In thousands]

State	Venereal disease control	Tuberculosis control	General health	Mental health activities	Heart disease control	Cancer control	Industrial waste studies	Hospital survey and planning	Hospital construction
Total	[1] $12,738	$6,781	$14,081	$3,294	$1,770	$3,246	[2] $913	$105	$56,968
Alabama	537	148	405	18	61	68	20	-------	1,393
Arizona	68	30	93	10	2	9	10	-------	224
Arkansas	264	101	288	47	29	60	17	-------	1,602
California	309	289	648	226	95	189	27	-------	1,552
Colorado	60	62	127	31	23	33	11	3	573
Connecticut	41	111	122	51	28	41	12	1	257
Delaware	29	31	24	24	13	7	9	-------	77
District of Columbia	221	61	61	23	19	18	10	-------	146
Florida	496	179	243	67	40	53	15	-------	1,797
Georgia	1,313	240	419	101	63	85	20	5	2,601
Idaho	41	23	80	8	17	19	10	2	585
Illinois	734	282	601	180	90	189	26	-------	1,959
Indiana	192	132	338	97	22	72	18	-------	2,065
Iowa	77	54	214	75	26	62	16	-------	1,228
Kansas	69	98	203	55	34	52	14	3	1,330
Kentucky	381	212	393	64	60	83	20	-------	1,588
Louisiana	536	154	330	80	31	69	18	-------	1,390
Maine	37	31	100	26	10	28	11	-------	226
Maryland	258	158	164	55	32	44	13	11	164
Massachusetts	106	272	347	122	57	113	31	6	1,122
Michigan	316	271	480	157	73	119	22	-------	2,123
Minnesota	76	110	302	70	48	71	26	5	1,352
Mississippi	715	189	395	78	59	76	16	-------	1,924
Missouri	284	101	368	65	-------	44	20	-------	792
Montana	23	19	60	24	9	9	10	-------	136
Nebraska	58	50	134	19	14	27	12	-------	673
Nevada	25	8	37	7	7	6	9	-------	9
New Hampshire	11	16	55	23	13	-------	10	1	679
New Jersey	154	142	326	121	54	90	18	-------	711
New Mexico	126	49	93	24	19	20	10	-------	609
New York	355	428	865	211	131	293	35	34	2,470
North Carolina	694	245	509	83	23	88	23	1	2,963
North Dakota	32	59	75	24	17	19	10	-------	272
Ohio	415	281	595	193	88	170	39	7	1,635
Oklahoma	230	137	260	63	47	61	17	1	1,535
Oregon	67	77	156	39	27	23	12	3	487
Pennsylvania	412	282	884	55	30	187	34	-------	3,342
Rhode Island	30	46	51	23	11	15	10	-------	138
South Carolina	474	180	300	52	48	58	17	-------	1,739
South Dakota	29	33	83	21	11	15	10	-------	247
Tennessee	413	206	394	81	60	62	20	-------	2,317
Texas	868	182	739	114	43	145	44	8	3,416
Utah	32	24	87	18	18	19	10	1	558
Vermont	18	23	49	20	6	13	10	-------	533
Virginia	337	233	322	90	11	62	18	12	1,808
Washington	84	92	186	62	33	49	24	-------	570
West Virginia	264	104	230	52	15	49	15	-------	248
Wisconsin	81	136	293	65	48	70	27	-------	1,380
Wyoming	19	13	50	-------	-------	12	9	-------	233
Alaska [3]	27	104	53	7	13	7	9	-------	-------
Hawaii	32	76	58	24	17	12	10	-------	188
Puerto Rico	250	182	384	25	24	59	20	1	-------
Virgin Islands	17	15	8	24	1	2	9	-------	2

[1] Includes $4,035,000 in cash and $958,000 in services and supplies for rapid treatment facilities and special demonstration projects.

[2] Excludes $82,000 paid to interstate agencies.

[3] Additional payment of $757,000 for disease and sanitation investigation and control.

The Public Health Service, through the Bureau of State Services, provides many types of aid to the Nation's health agencies. The system of financial grants is the backbone of many of the health programs conducted by States and localities.

Almost every program of the Bureau of State Services offers consultation and advice in its special field. Technical aid in the administration of disease control activities helps State programs run more smoothly. Demonstrations of new public health techniques and "pilot" programs not only help point the way for State and local action but are also valuable educational devices.

In addition to its work with the States, the Public Health Service cooperates with interstate agencies, with management and labor, and with other official and nonofficial organizations. Cooperation with industry is of particular importance in the environmental health programs of the Service.

Grant-in-aid and consultative activities of the Public Health Service are channeled through the Federal Security Agency's regional organization. Administratively responsible to the Bureau of State Services, the regional medical directors work closely with the States in their areas and stand ready to help them with any specific problems. They are also responsible for combatting the spread of disease from one State to another and for inspecting Public Health Service hospitals and quarantine stations. The regional medical directors meet twice a year in Washington to coordinate their activities and to advise the Surgeon General on policy matters.

Grants for State Health Work

Appropriations for State grants for public health services in 1950 amounted to more than $45 million. Reports to the Division of State Grants showed that the Nation's 1950 investment in public health services amounted to an estimated $231 million, not including funds for general hospital care and tuberculosis sanatoria. Of this sum, the States appropriated $96 million and localities $90 million. Federal grants provided only about 20 percent of the total tax funds expended for public health services during the year.

GRANTS IN 1950

Grants to the States for public health services increased approximately $5.5 million over the amount appropriated in 1949. Increases were noted for general health activities, cancer control, heart disease control, and water pollution control. However, grants for venereal disease control were decreased by approximately $1.5 million.

A total of $100 million in grants (including hospital survey and construction) was certified during 1950 for payment to the 48 States,

the Territories, and insular possessions, and the District of Columbia, and six interstate water pollution control agencies. Payments were as follows:

Venereal disease control, including rapid treatment facilities and special projects	$12.7 million
Tuberculosis control	$ 6.8 million
General health	$14.0 million
Mental health activities	$ 3.3 million
Heart disease control	$ 1.7 million
Cancer control	$ 3.2 million
Hospital construction	$57.0 million
Industrial waste studies	$995,000
Hospital survey and planning	$105,000
Special grant to Alaska	$757,000

General grants, oldest of those administered by the Public Health Service, aided States to supplement their own appropriations for the basic programs of all public health work: environmental sanitation, public health nursing, laboratories, health education, communicable disease control, and local health services.

States used approximately $9.5 million in general health grants to strengthen existing local health departments and to support activities which provide health services to local areas. Special grants enabled many States and localities to expand their programs in mental health, heart disease control, and cancer control.

TRENDS IN PUBLIC HEALTH ADMINISTRATION

As new special grants have been added to the Nation's public health services, the number and variety of State agencies responsible for administering the various programs have steadily increased. This increase has multiplied the already complicated mechanism of processing and certifying grant programs. For example, in only 22 of the 53 jurisdictions do the health departments administer all nine health programs for which Federal grants are made available.

Nevertheless, the trend is toward placing responsibility for all health services in a single State agency—the State health department. All but eight State programs of hospital planning and construction now are administered by the health departments. Twenty-four State health agencies are responsible for the licensure of hospitals and institutions and 37 administer the State mental health program.

The special problems of water pollution control, on the other hand, have stimulated interstate collaboration. Grants for the study of industrial wastes, for example, are administered by ten interstate agencies serving 29 States; and 19 others have separate commissions.

The Public Health Service works constantly to simplify the administration of grants and to unify them wherever possible. Gains were

made in 1950 by so adjusting the Federal-State formulas for the allotment of grants that in the future matching ratios required of the States will be uniform for all grants except those for hospital planning and construction. In the past, these ratios varied from grant to grant.

A recent development in all governmental agencies—Federal, State, and local—is the new emphasis on administrative management. The Public Health Service offers assistance to State and local health agencies in improving their management and organization and record keeping, and in solving special administrative problems. Two surveys were made during the year at the request of the State Health Departments of Illinois and Vermont.

An Indispensable Tool—Vital Statistics

Vital statistics are the yardsticks of progress and problems in public health. Information obtained through vital records has a direct influence on the planning and administration of health activities in each of the States. Statistical reports are also useful in commerce and industry and provide the basic data for the study of social and economic problems.

The Public Health Service, through its National Office of Vital Statistics, helps States, communities, other governmental agencies, and foreign countries to gather and use vital records effectively. In addition, it collects and publishes the vital statistics of the United States and maintains the birth-and-death registration areas. Cooperation with State agencies, which have the primary responsibility for collecting and processing vital records in their areas, is the keystone to success in this field.

The Public Health Conference on Records and Statistics, established in 1949, met in April 1950. Membership includes representatives of the vital registration and statistical activities in each of the States.

IMPROVING RECORDS

During the year, a joint project by the Public Health Service, the Bureau of the Census, and State offices of vital statistics was begun. The objective is to take advantage of the 1950 Decennial Census of Population and Housing in determining the completeness of birth registration. Birth records filed for infants born during the first 3 months of 1950 will be matched against cards filled out by the Census enumerators for infants born during this period and alive on April 1, 1950. Results of the test will reveal the local areas throughout the country in which birth registration is incomplete. These areas can then be given help in improving birth registration activities.

Current statistics on marriages and divorces are incomplete because of the lack of uniform reporting. There is pressing need for more

complete statistics by which marketing, manufacturing, and merchandising operations can be projected. Progress was made in 1950 toward obtaining more complete reporting of marriages and divorces.

REPORTING SICKNESS

Wide variations exist in the reporting of communicable diseases and there are serious gaps in available morbidity data. A committee on communicable disease reports was established to study the needs for morbidity reports and the reporting procedures now used, and to develop a minimum list of reportable diseases. The standards and procedures developed will be submitted to State health departments, the Public Health Conference on Records and Statistics, and an appropriate committee of the American Public Health Association. Subsequently, the revised statement will be submitted for approval by the Association of State and Territorial Health Officers.

Education for Health

Good health, in its deepest sense, is the result of a partnership between the individual and the community in which he lives. Most people will support essential health services and will practice desirable habits of personal hygiene to the extent that they understand basic health principles. The process by which people acquire the knowledge and gain the understanding is called health education.

Helping State and local health agencies to develop educational programs in the communities is an important function of the Public Health Service. The Service also assists voluntary health agencies to enrich their educational programs and to make their educational materials more effective. During the year, the Public Health Education Division assisted 28 States to strengthen their programs in this field. As one immediate result, six States worked out better methods for reaching people living in rural areas and intensified their health council activities.

The health educators also have helped many agencies and groups to study and interpret the reactions of people to their programs and informational activities. Some agencies have begun to conduct exploratory studies on popular attitudes toward cancer and tuberculosis and to evaluate the educational activities of pharmacists in cancer control.

The Public Health Service and other agencies are showing an increased interest in evaluating and checking the effectiveness of their educational materials. Pretesting has proved a valuable guide in preparing materials which can be more easily understood and which will be more likely to influence behavior favorably. By means of pretesting and revision on the basis of the tests, the materials have shown increased effectiveness.

The Public Health Service works with the Office of Education to improve school health programs, both through participation in health instruction for teachers and through help in the conduct of school health services. During the year, the Public Health Education staff also assisted the schools of public health in training health educators; they advised on health education curricula in five universities, and assisted in developing standards for the preparation of health educators.

Public Health Nursing

There are still far from enough nurses engaged in public health work to meet the need. It was encouraging, however, to see their number growing steadily. On January 1, 1950, more than 25,000 nurses were employed in public health work in this country, an increase of almost 2,000 over last year's figure.

Several factors tend to limit the available supply of public health nurses. Although there are more active graduate nurses in the United States now than ever before, the demand for their services in hospitals, industries, and private physicians' offices has grown disproportionately. Moreover, the salaries paid in public health work are not high enough to attract the nursing school graduate, particularly in view of the additional training that is usually required. Few nursing schools stress the preventive approach to health problems, and the young graduate is likely to know little or nothing about public health. The universities which do offer training in public health nursing must restrict their enrollment because of the limited facilities available for field practice under competent supervision.

Through its Public Health Nursing Division, the Public Health Service provides leadership and guidance in the development of this basic activity. The staff furnishes direct consultation services to health and nursing administrators, participates in the work of numerous organizations, and directs or aids in surveys of public health nursing needs and problems. The staff also assists State and local health agencies in establishing or improving their nursing programs. On June 30, 1950, eighteen public health nurse supervisors were working in various capacities with States. Ten others were assigned to selected local health departments which are experimenting with bedside nursing as a part of their normal service to the community.

A Healthful Environment

Our physical environment is a combination of many ingredients—the air we breathe, the water we drink, the food we eat, the homes we live in, the work places, schools, and public places in which we spend

a large part of our days. One of the major responsibilities of the Public Health Service is to help improve the sanitary quality of all these basic ingredients.

The development of adequate sanitation programs in State and local health departments is the principal stepping stone to a healthful environment. The Public Health Service, through its Division of Sanitation, assists States and communities to strengthen these programs in four major fields: (1) municipal and rural sanitation; (2) the protection of health aboard interstate trains, planes, ships, and buses; (3) milk and food sanitation; and (4) shellfish sanitation.

CITY AND RURAL SANITATION

"Urban Fringe" Problems

Special precautions are needed to counteract the rapid rise of insanitary conditions in "urban fringe" areas now developing from the Nation's record-breaking home building program. At the request of the authorities, the Public Health Service made investigations of such areas in several States. A Wisconsin State law, known as the Town Sanitary District Law, appears to be a valuable measure for controlling public health hazards in "urban fringe" areas.

Home Accidents

During the year, there was growing interest in the prevention of home accidents. This interest was reflected in the number of requests by State and local agencies for information and help on the development of home accident programs. At the end of the year, eight State and 21 local health departments were conducting preventive programs. Other States and communities have been collecting background material and participating in training programs, in anticipation of setting up their own programs.

An agreement was made with the National Safety Council to exchange information and assistance in the prevention of home accidents. Ideas, material, and program plans were also exchanged with representatives of several foreign countries.

Refuse Disposal

Two States began studies of trichinosis in relation to the infection of hogs by rats and by the feeding of raw garbage. In Jasper, Indiana, garbage grinders have been installed in the majority of homes, and a study is being made to see what effects this community-wide installation has on municipal sanitation. At Mandan, N. D., a sanitary landfill has been maintained through sub-zero weather, the lowest point in 1950 having been 43 below. This demonstration proves that the landfill method of refuse disposal is practicable in any of our Northern States.

INTERSTATE SANITATION

During the year, 26 sets of plans were reviewed and approved in connection with the construction, reconstruction, or repair of trains, buses, and airliners. Shipbuilders and equipment manufacturers submitted approximately 1,000 ship plans, of which 124 were returned for alteration. Forty Certificates of Sanitary Construction were issued during the year to newly constructed or converted vessels.

About 2,400 inspections of ships were made and Certificates of Compliance were issued to 334 vessels meeting all sanitary requirements. All but 376 of the 2,200 railroad dining cars in operation were inspected. At the mid-year point, the average sanitation rating for these carriers was 70 percent, an improvement of 6 percent over ratings issued a year earlier.

At least once a year State health agencies inspect approximately 1,200 water supplies serving interstate carriers and United States ships in foreign trade. They report their findings to the Public Health Service. Inspections are also made at least once a year at the 3,000 watering points in the country to ensure the sanitary transfer of water to the carriers. Approximately 549 milk plants and 377 commissaries of airlines, railroads, and bus companies were inspected. The carriers were informed about unsatisfactory plants and commissaries and were instructed to discontinue use of the products immediately.

MILK AND FOOD SANITATION

The most recent reports (1948) show a total of 11,660 cases of disease in 375 outbreaks traced to contaminated milk, food, or water. Of these, 21 outbreaks were traced to water, 17 to milk and milk products, 327 to other foods, and 10 to undetermined sources.

The reported figures represent only a fraction of the total number of cases of milk-borne and food-borne diseases which occur annually. Many thousands of these cases probably never come to the attention of physicians or public health workers. Many outbreaks of disease are not investigated to determine the source of infection and only a few States require the reporting of cases of food infection.

Model ordinances and codes developed by the Public Health Service in the past have helped promote uniformity in milk and food control programs throughout the United States. The milk ordinance recommended by the Public Health Service now protects the milk supply of over 58 million Americans.

Approximately 90 percent of the total market milk supply in the United States is now pasteurized. This means that the Nation has come close to the 100 percent goal long pursued by our Federal, State, and local health agencies. Pasteurization of all milk, except "certi-

fied milk," is now required in six States, 18 counties, and 881 cities. In hundreds of other cities and counties, all milk sold is pasteurized even though pasteurization is not required by law.

Considerable progress was made during the year in developing sanitary standards for milk and food equipment which are acceptable to both public health authorities and industrial groups. The Public Health Service is cooperating with committees of the International Association of Milk and Food Sanitarians and the Dairy Industries Supply Association in these efforts.

Shellfish Sanitation

Improvement in this field during 1950 is reflected in the ratings given to the six States with the lowest scores among the 20 shellfish producing States. The lowest rating in 1949 was 55 percent and in 1950, 73 percent. The average of the six lowest ratings was 76 percent in 1950 as compared with 68 percent in 1949.

Research in Environmental Health

Although improvements in cleaning up the environment have brought about great advances in health in the past, many discoveries still must be made about our environment. The effect of housing on health, the treatment of sewage and industrial wastes, the health hazards associated with radioactive materials are but a few of the areas in which knowledge is incomplete. The Environmental Health Center, with its base laboratories at Cincinnati, Ohio, is the research and investigation center of the Public Health Service in this field.

Physicians, engineers, biologists, bacteriologists, chemists, and radiologists form a working team in the search for new defenses against environmental hazards. Through laboratory research, field surveys and investigations, consultation, and technical training for environmental health workers, this team provides services and guidance in a Nation-wide effort to improve environmental health.

During the year, studies in the disposal of radioactive wastes resulted in practical methods for the treatment of certain wastes. Investigators also evaluated the effectiveness of new detergents and sanitizing agents, including the quaternary ammonium compounds used in dairy and restaurant sanitation.

An exhaustive study of sewage disposal systems in individual households has already yielded facts which will lead to new practices in this field. Considerable work has been done to discover the ways in which various industrial wastes—fluorides, cyanides, cobalt and chromium compounds—affect the natural ability of water to purify itself.

Work now under way on pollens is of special interest to persons who suffer from hay fever and other allergies produced by pollens in the

air. Laboratory workers discovered that procedures now in use do not provide an accurate measurement of the pollen concentration in the atmosphere. They are now attempting to develop more reliable instruments and methods so that State and local health agencies can test the success of new techniques for eradicating such plants as ragweed.

Studies of the bactericidal action of high-frequency sound waves have revealed that some strains of bacteria are killed by ultrasonic exposure. This work is of great significance, since it may lead to the development of new methods for preventing the spread of some infections both indoors and outside.

Field investigations were devoted largely to studies of water pollution and industrial wastes and to an inventory of water and sewage facilities in the United States. Three water pollution surveys were completed on the basins of the Kansas and the South Platte Rivers and on the boundary waters between Canada and the United States in the Lake Erie and Lake Ontario section. As a result of these studies, detailed plans have been made to clean up the pollution in these areas.

A Start Against Water Pollution

Under the Water Pollution Control Act of 1948, the Public Health Service was given the responsibility for cooperating with other agencies in cleaning up our contaminated waterways. Ten river basin offices have been established by the Division of Water Pollution Control to correspond with the important drainage areas in the country. Comprehensive reports are now being prepared on approximately 250 individual river basins within the drainage areas. The reports, scheduled to be completed in 1951 and 1952, will also indicate needs for corrective action at each source of pollution.

The Water Pollution Control Act authorizes $22.5 million a year for 5 years for loans to States for the construction of sewage treatment works, and grants of $1 million a year to State and interstate agencies for surveys and research on industrial wastes. No funds have yet been made available for construction loans. During 1950, grants totaling $995,000 were allocated to State and interstate agencies for surveys and research.

The President's Reorganization Order No. 16 (March 13, 1950) made the Public Health Service responsible for administering grants and loans for planning and construction of treatment works. The sum of $200,000 was available for planning grants in 1950.

Three new interstate compacts were created during the year. This brings the number of interstate agencies for water pollution control to 10, serving 29 States.

ADVISORY GROUPS

The Public Health Service is assisted in the work of water pollution control by several official and nonofficial groups and committees. The Water Pollution Control Advisory Board, established by the Act, consists of representatives of Federal, State, and local agencies, and of industry, conservation groups, and others concerned with water resources. The Board, which has met four times, has urged industry and local communities to take immediate remedial measures without waiting for Federal financial assistance to aid construction. It has also emphasized the responsibilities of the States in water pollution control.

At the invitation of the Public Health Service, 22 major industries have voluntarily organized a National Technical Task Committee on Industrial Wastes. Among the tasks which the Committee has undertaken are: (1) the development and adoption of practical methods for reclaiming, reducing, and treating wastes; (2) the promotion of more effective cooperation between industry and official agencies; and (3) the dissemination of information on developments in this field. Four working groups, composed of representatives from such industries as food, minerals, chemical processing, and a general industrial group, have been appointed to carry out the work of the task committee.

A Water Resources Policy Commission was established by the President in January to make recommendations on national policy for water resources. The Public Health Service is working closely with the Commission. For example, at the Commission's request, special reports are being prepared on the major drainage areas of the United States. The Public Health Service hopes that its work in this field will contribute much to the formulation of national policy for better use of the Nation's water resources.

Health for Industrial Workers

Industrial hygiene means the science and skill essential for safeguarding the health of industrial workers and for solving the special problems of occupational disease. The application of industrial hygiene principles calls for the unique skills of the public health professions. Since 1914, the Public Health Service and the State and local health agencies have worked together, with increasing success, to raise the level of industrial health in our country.

Many other factors have contributed to the present high level of health and productivity among the Nation's workers; but it is safe to say that the extraordinarily high level of industrial hygiene now maintained in the United States is due primarily to the efforts of these health agencies, in collaboration with management, labor or-

ganizations, the insurance industry, and labor agencies. No other industrial country in the world has gone as far as the United States in providing adequate safeguards for the health of its workers or in solving the enormous, complex problems of health hazards within the industrial environment.

So much has been accomplished, in fact, that we are sometimes inclined to forget the requirements of industrial hygiene—the long, patient, scientific research to detect the hazards in elusive dusts, fumes, and chemical substances; the constant attention to the physical signs of approaching illness among workers; the intensive, creative thought required to devise effective controls of occupational hazards. The Industrial Hygiene Division of the Public Health Service and colleagues in State and local health departments and labor agencies continue to apply these principles in the task of protecting the health of America's workers.

FIELD STUDIES

Radiation Hazards

Studies of radiation hazards in the mining and milling of uranium ore were begun in the Colorado plateau, where more than 2,000 workers are employed. Preliminary studies indicate that, unless proper safeguards are employed, lung cancer may result from exposure to vanadium and silica dust. Other possible threats to health from radiation-producing machinery and radioactive materials are also under study. It has been found, for example, that faulty X-ray shoe-fitting machines are dangerous, both to persons using them and to the operators of the machines.

Industrial Cancer

A Nation-wide investigation into the possible relation of health hazards associated with the manufacture of chromates and bichromates to cancer of the lung has been launched by the Division. Preliminary medical and engineering work has been completed in this study, which covers about 1,500 workers, employed in seven plants.

Air Pollution

Following the Donora, Pa., "smog" survey of 1948–49, the Public Health Service was requested to conduct similar investigations by numerous States and communities. Preliminary surveys are now under way in several areas. A special study of air pollution is being made over the international boundary between Windsor, Ont., and Detroit, Mich. The study was requested by the International Joint Commission on the pollution of interstate waters.

INDUSTRIAL TOXICOLOGY

Investigations were made of poisoning from metal fumes, gases, and dusts, organic solvents, plasticizers, synthetic resins, and unusual substances. A study of methylal, an effective new low-boiling solvent for many carbon compounds, indicated that although methylal has certain narcotic properties, it has a relatively low toxicity rating in comparison with many other industrial solvents.

Operators of mine locomotives sometimes contract silicosis by inhaling the dust created by the constant grinding of the wheels over the sand used on the rails to provide traction. Various substances, such as blast furnace slag and pulverized trap rock, have been substituted on an experimental basis in an effort to eliminate this hazard. Further study is needed to find a material hard enough to provide sufficient traction and inexpensive enough to permit commercial use.

Industrial anthrax is a problem which has become increasingly serious since the war. Studies of this disease, prevalent among workers handling imported wool, hair, skins, and hides, have traced the majority of the cases to industries which process carpet wool. Samples of carpet wool imported from various parts of the world have been collected for further study. Several industrial disinfectants have been tested and one—ethylene oxide—appears to be effective.

MEDICAL SERVICES AND PREPAYMENT PROGRAMS

Work has been under way to collect and analyze detailed information on individual medical care plans in industry and on voluntary prepayment health programs serving industrial workers. Data of this nature should help answer questions such as the number of persons covered by a program; the volume of service provided; and the cost, quality, organization, and administration of the services. Particular attention is being given to recent collective bargaining agreements which include health programs in their provisions.

Reporting of Occupational Disease

To meet the long-felt need for uniform and adequate reports of occupational disease, the Public Health Service last year began a two-year pilot study in this field. Ten eastern States, each with a different system of collecting data, are participating in the effort to develop a system which may eventually be applied throughout the country.

Progress Against Venereal Disease

The Nation moved closer in 1950 toward the goal of conquering venereal disease. Reports to the Venereal Disease Division indicated

that the steady downward trend in total numbers of cases of syphilis and gonorrhea continued during the year. Syphilis mortality rates and admissions to mental hospitals because of syphilis went down. Only congenital syphilis failed to show a substantial decrease.

Although these latest data are encouraging, syphilis continues to be a major problem in the United States because:

1. Over 230,000 cases of syphilis were newly reported in 1950 in the continental United States.

2. Almost 14,000 cases of congenital syphilis and more than 32,000 cases of early infectious syphilis were reported in 1950.

3. Syphilis caused the death of an estimated 13,000 persons in this country in 1949, the latest period for which figures are available.

TREATMENT FACILITIES

Although newer forms of penicillin have made it possible to treat syphilis on an out-patient basis, the volume of referrals to in-patient treatment centers continued to be large. In 1950, clinics referred 60 percent of 19,000 cases of primary and secondary syphilis and 45 percent of 41,000 cases of early latent syphilis to rapid treatment centers or other in-patient facilities. Nevertheless, admissions to rapid treatment centers have paralleled the decline in the reported cases of syphilis. Thus, the number of patients treated in rapid treatment centers was about 19 percent below the 1949 figure.

The Public Health Service made allotments to 53 rapid treatment center projects. These funds helped to provide treatment services in 40 States, the District of Columbia, Alaska, Puerto Rico, and the Virgin Islands.

CASE FINDING

The importance of case finding in venereal disease control programs is reflected in the number of diagnostic observations completed in State and local venereal disease clinics. The tentative figure for the year is 2.6 million observations. As a result, almost half a million cases of venereal disease were diagnosed.

The three methods of case-finding widely used in venereal disease control are mass testing programs, contact investigation, and public appeal. Most health departments combined two or more of these methods in their case finding programs. During the year, the Public Health Service assisted 32 States in the administration of 59 such projects. This assistance took the form of allotment of funds and assignment of personnel and supplies. The projects affected about 17,000 communities with a total population of approximately 68 million.

Congenital Syphilis

The Venereal Disease staff gave increased attention to the problem of congenital syphilis. A cooperative program was developed with the Children's Bureau.

Despite the fact that congenital infections can be prevented by giving adequate penicillin treatment to pregnant women with syphilis, this form of the disease has remained at a constant level in morbidity reports for several years. Public health workers in both venereal disease control and maternal health programs therefore redoubled their efforts to find and treat the disease in pregnant mothers. They also sought methods to find cases of congenital syphilis early since response to treatment depends largely on the promptness with which the disease is detected and treated.

A study of the efficacy of penicillin, given before pregnancy, produced striking results. It was found that, when a woman with syphilis has responded satisfactorily to treatment with penicillin before she becomes pregnant, additional treatment after conception is not necessary to protect the child.

RESEARCH IN VENEREAL DISEASES

Basic and clinical research in venereal disease forms the roots from which technical improvements in the venereal disease control program spring. Investigations conducted under the control program are attempting to solve the unknowns of venereal disease. Research projects are conducted at the Venereal Disease Research Laboratory, Atlanta, Ga., in other Federal laboratories and research centers, and in nonprofit institutions aided by financial grants.

A promising research finding in serologic testing for syphilis involves the use of specimens of blood collected from heel or finger by puncture in capillary tubes or on filter paper. Should evaluation bear out the early promise of these procedures, venereal disease control workers will have a much simpler method than collecting blood by syringe. It would be especially helpful in obtaining specimens from infants and young children.

Progress against Tuberculosis

In recent years, tuberculosis has been declining rapidly and steadily as a major cause of death. However, this disease remains a serious health problem in the United States. Although the national tuberculosis death rate had fallen to 26.5 per 100,000 by 1949, the disease still kills more than 40,000 Americans each year, and there are probably a half-million Americans who have tuberculosis and require medical and public health supervision.

During 1950, 20 physicians of the Tuberculosis Division gave direct service to State and local health agencies: three of them were loaned to State health departments, and eight to local health departments as tuberculosis control officers. The other nine were assigned as Public Health Service regional consultants and tuberculosis hospital staff officers. Many nurses, X-ray technicians, and other personnel have been sent out to areas where their services are needed.

TUBERCULOSIS CASE FINDING

Case finding by the mass survey method has expanded rapidly. There is wider acceptance of its value, not only in early detection of tuberculosis but also in bringing to light other chest diseases and abnormalities of the heart. During 1950, over two million X-rays were taken by photofluorographic units of the Public Health Service, almost all in community-wide chest X-ray surveys in Denver, Boston, Salt Lake City, San Diego, and Los Angeles.

The Tuberculosis staff assisted each of these cities in preparing and planning for the programs. They also took the miniature X-rays, and developed and interpreted the films. Members of the staff took part in planning and executing the follow-up of cases discovered during the survey, as well as in setting up case registers and records.

The Public Health Service, working with health officers, tuberculosis control officers, and the National Tuberculosis Association, made efforts to formulate generally acceptable standards for reporting tuberculosis cases. Records consultants helped various health departments to revise their record systems and, as a result, to improve case supervision and tuberculosis control operations in general.

TUBERCULOSIS NURSING

Nurses of the Public Health Service, through consultation services, assisted 13 State and 36 local agencies in problems related to tuberculosis nursing. In an effort to alleviate the critical shortage of tuberculosis nurses, nursing consultants were temporarily assigned to six States, five cities, and the Territory of Alaska. There was an expansion of social work consultation services, with direct assistance to patients with newly discovered tuberculosis in the cities where mass surveys had been conducted. In two large cities, studies of social welfare resources were made in collaboration with the Public Health Service.

RESEARCH PROJECTS

A project completed during 1950 has revealed that streptomycin has value in the treatment of many cases of pulmonary and miliary tuberculosis, but that its action in the meningeal forms of the disease is rather disappointing. Another undertaking has centered around

the problems of detecting early tuberculosis. The studies include evaluation of tuberculin testing, the interpretation of "doubtful" reactions, and the differential diagnosis, by skin tests, of tuberculosis and certain fungus diseases, particularly histoplasmosis.

Studies of immunization against tuberculosis by means of BCG vaccine were expanded. Programs designed to assay the efficacy of various forms of the vaccine, as well as several different modes of administration, have involved some 268,000 persons in Georgia, Puerto Rico, the Virgin Islands, and elsewhere.

Applied research programs conducted in cooperation with several university schools of medicine have dealt with such problems as bacterial growth factors, immunization procedures, and the development of new antibiotics active against the tubercle bacillus. A wide variety of questions relating to the laboratory diagnosis of tuberculosis have been investigated. New in vitro tests for assay of virulence have been developed, and culture methods and media have been improved.

Teamwork Against Communicable Diseases

Communicable disease control is a major responsibility of the Public Health Service and the State and local health departments. Gains in this field have been remarkable since the turn of the century. Methods for combating a great many of the communicable diseases have been vastly improved. There are, however, many important problems to be solved before the health agencies can consider communicable disease control as "finished business."

Application of known methods must be improved and extended to areas where the prevalence or incidence of infections is high. Efforts must be intensified to find ways for controlling such common infections as poliomyelitis, encephalitis, and influenza. Constant attention must be given to further improvement of methods for combating such diseases as malaria, typhus fever, rabies, and the dysenteries. Through its Communicable Disease Center, with headquarters at Atlanta, Ga., the Public Health Service is working toward the solution of these problems—in cooperation with State and local health agencies, universities, hospitals, and other institutions throughout the United States.

GAINS IN 1950

New gains were made in several sectors of the communicable disease control program. For example, malaria continued to decline in the 13 southeastern States where intensive campaigns to eradicate the disease are being conducted. For the first time in the history of disease reporting, an entire 12-month period (fiscal year 1950) passed

without a single case of malaria in Georgia, South Carolina, and Arkansas.

Rat control measures are being stressed in typhus fever control, whereas in former years emphasis was placed on eradicating the oriental rat flea which carries the disease. The Public Health Service is participating in the control programs of eleven southern States where the disease prevails. Activities in 1950 were concentrated in 109 counties, as compared with 188 in 1949.

FIELD INVESTIGATIONS

One study sought to find out whether an anti-fly campaign would reduce the prevalence of diarrheal diseases in several Georgia communities. The results so far show that direct action against flies by means of quick-killing and residual sprays leads to a significant decline in dysentery due to *Shigella* infections; the method, however, failed to lower the prevalence of *Salmonella* infections. Improved garbage collection alone, without other control measures, did not reduce the fly populations enough to affect transmission of diarrheal diseases.

An investigation in Kern County, Calif., and Yakima, Wash., revealed that the incidence of clinical cases of virus encephalitis among human beings and horses has increased in Kern County during the past four years. Several strains of the Western equine virus were isolated from Kern County mosquitoes and one from bird mites. No virus infections were recovered from Yakima Valley mosquitoes or mites.

Studies of Q fever in collaboration with the California State Health Department continued. In several recent outbreaks of the disease, it has been observed that Q fever attacks mostly adult males.

Four plague survey teams patrolled the borders of known plague-infested areas from North Dakota to Texas, collecting 33,000 wild rodents from which 67,000 fleas were removed and examined. The disease was found to exist in seven of the States, with new foci in four areas of Kansas and New Mexico.

POISONS FOR PESTS

A great deal of new information was gained during the year about chemicals used to kill insects and animal pests. Of first importance is the study of the effects which these chemicals may have upon human beings and domestic animals. The Public Health Service is conducting many intensive investigations in this field of toxicology.

A new insecticide, dieldrin, has been proved effective in controlling house flies that are resistant to DDT; but dieldrin is about five times as toxic to warm-blooded animals as DDT. Some strains of house

flies rapidly develop resistance to dieldrin, as well as to other insecticides.

A recently developed rodenticide, warfarin, appears to have many advantages over the poisons formerly available for rat control work. Rats do not refuse to take bait containing warfarin, and the poison may be used in very small quantities mixed with inexpensive baits. Warfarin acts as a cumulative poison and takes effect in rats only after they have had several small doses over a period of several days. The chief disadvantage is that the rats may die in inaccessible places within buildings. Research is under way to improve the methods of administering the poison so as to overcome this disadvantage, and at the same time to develop additional safeguards for human beings and domestic animals.

An experimental formula, S–43, was tested with 63 other preparations for killing insects aboard aircraft. It was found to be more effective and less expensive than the standard formula used in international air transport. The spray also appears to be less irritating to human beings.

IMPROVING LABORATORY WORK

Services to States and other agencies in laboratory diagnosis and analysis were expanded during the year. Gains were also made in research on laboratory methods, and in the evaluation of State laboratories. Twelve units, representing the scientific specialties concerned with the major problems of communicable disease control, took part in the work.

More than 300,000 specimens were submitted to the Communicable Disease Center during the year. Over 200,000 of these came from laboratories which are cooperating with the Public Health Service in a program designed to establish uniform techniques and evaluate the performance of diagnostic tests. The remaining specimens came from other health agencies, Federal hospitals, universities, and private physicians and hospitals.

Chronic Disease—the Number One Problem

A concerted movement to meet the needs of the chronically ill is now gaining direction and momentum. Public health is playing a large part in this Nation-wide movement. Although this is a relatively new field in public health, those who are dedicating their efforts to the control of long-term illness are approaching the problem with a keen awareness of the things that need to be done. There is recognition that efforts for prevention must be unrelenting; that early detection is essential. Adequate treatment and medical supervision can go far in maintaining reasonable physical capacity. Medical

rehabilitation restores to many who are physically disabled the ability to work productively and live happily. The Chronic Disease Division is helping translate these principles into action.

CHRONIC DISEASE CENTERS

State and local health departments are showing an increasing interest in the problem of chronic disease. One measure of this interest is their participation and planning in the establishment of chronic disease centers.

During the year, an important beginning was made in the development of clinical facilities for chronic disease control. With the active help and support of the Public Health Service, State and local agencies put three new facilities into operation. These are the Chronic Disease Research Center, on the site of the former U. S. Marine Hospital in Pittsburgh, Pa., the Chronic Disease Research Institute in Buffalo, N. Y., and a chronic disease and cardiac restoration center on the site of the former Public Health Service quarantine station in Charleston, S. C.

MULTIPLE SCREENING

During the year the Public Health Service was active in studying and evaluating a new case finding procedure, multiple screening. This technique combines tests for several specific diseases in a single screening operation. Some of the conditions usually looked for in the multiple screening process are: tuberculosis, syphilis, diabetes, heart disease, glaucoma, anemia, hypertension, obesity, and hearing and vision defects.

In an effort to study the efficacy of the various tests employed and to determine the value of the procedure as a whole, the Public Health Service cooperated with several local health departments in demonstrations of multiple screening. Demonstration projects were conducted in Richmond, Va., Atlanta, Ga., the State of Alabama, and Hartnett County, N. C., in which a total of about a half million people passed through the screening lines. Results of these studies are now being analyzed in order to ascertain the place of multiple screening as a tool of public health practice.

HEART DISEASE CONTROL

At the close of the first year of the grant-in-aid program for control of heart disease, plans were under way in many States and localities to launch comprehensive programs against this leading cause of death. As yet, most of the activities are of an introductory or exploratory nature, devoted to the development of plans and teamwork in this field. Under the guidance of the Public Health Service, however,

many States expanded their clinical services for cardiac patients during the year.

To increase the fund of statistical knowledge about heart disease, a new system of tabulating data was developed and put into effect, with the cooperation of State health departments. Because it collects and puts into usable form the information upon which control programs are based, this system will fill a major need in heart disease control.

DIABETES CONTROL

Many States and localities expanded their efforts to control diabetes, another important chronic disease. Because many people have this disease without being aware of it, emphasis was placed on mass screening programs to discover hidden diabetes. Blood sugar determinations for diabetes were incorporated in the multiple screening programs. Thus, large groups in the population have participated in the screening process for diabetes, and the Public Health Service has had a better opportunity to evaluate the techniques and the performance of the tests for the detection of diabetes.

A kit of materials for the education of patients with diabetes was completed and made available to physicians, hospitals, clinics, and public and private health agencies. The kit, entitled "Taking Care of Diabetes," consists of film strips in color and sound and supporting printed materials. It is designed to serve as an aid to instructors working with groups of diabetic patients and their families.

HOME CARE OF THE CHRONICALLY ILL

Home care is one of the promising new methods of caring for the victims of chronic illness, with great benefit to the patient and reduced strain on community facilities. During the year, the Chronic Disease staff conducted a demonstration in the methods of home care at Gallinger Hospital, Washington, D. C. In this program, the efforts of the physician, the medical social worker, the public health nurse, and other personnel are combined to provide care of hospital quality in home surroundings. This not only helps patients and their families to help themselves in a familiar environment, but also releases needed hospital beds for the acutely ill.

OBESITY CONTROL

In cooperation with the Massachusetts Department of Public Health, the Public Health Service last year instituted a pilot study in the use of group methods for weight control. Since obesity is associated with several chronic diseases, its importance in preventive medicine is now beginning to be recognized. The purpose of the Massachusetts study is to find ways by which overweight persons

can lose excess pounds and then maintain normal weight. The methods under study include group therapy techniques, operation of a community weight-control center, and psychological testing.

For Better Dental Health

The dental public health program concentrated on the prevention of dental decay among children by means of applications of sodium fluoride to the teeth. By the close of the year, 285 communities had taken over the demonstrations conducted by the Public Health Service and had established community-wide programs to provide this service for all children. About 100 other localities had made plans for such programs.

PREVENTING DENTAL DECAY

The Dental Public Health Division had 39 teams in the field during the year. The teams reached 415 communities and applied sodium fluoride to the teeth of 200,000 children in the course of their demonstrations. Community dental health programs established on the basis of these demonstrations are expected to provide the following services: dental inspections; applications of sodium fluoride; follow-up service; dental care of children whose parents cannot afford to pay for private care; and dental health education. Children who need dental care and whose parents can afford to pay are referred to private dentists.

In some communities, the shortage of dentists and dental hygienists has proved to be a stumbling block for the parents who want to have a local dental health program. The Nation has approximately 7,000 dental hygientists and only 20 schools of dental hygiene. The schools graduated about 600 students in 1950. At least 3,000 dental hygienists would be needed to staff local "fluoride programs" alone, if such programs were established throughout the United States. The demonstration program is helping to inform the people on the need for training more dental hygienists and is stimulating interest in the problem. During the year plans had been made for opening four new schools of dental hygiene.

Other Preventive Measures

Emphasis was placed on the treatment of public water supplies, either by adding fluorides so as to reduce dental decay or by reducing the natural fluorides in the water so as to prevent mottled enamel.

The Grand Rapids, Mich., project (see under Dental Research) has produced some significant findings, although it will require several more years to get conclusive evidence. Data for the four years 1945-49 indicate that fluoridation of the water supply reduces the incidence

of dental decay in the permanent teeth of 5, 6, and 7 year-old children. No significant benefits have been observed, however, for children between the ages of 9 and 16.

Two communities—Britton, S. D., and Bartlett, Tex.,—have municipal water supplies with excessive fluorides. Virtually all children who drink these waters have mottled enamel, much of which is severe. At Britton a new type of plant which reduces fluoride concentration, through the use of the tricalcium phosphate method, was put into operation in December 1948. At Bartlett, pilot studies have been completed which indicate that the alumina method of removing fluoride is about half as costly as other available methods. Preparations are now under way to construct a full-scale plant for removing excessive flourides.

Clinical tests of solutions of fluoride and different application techniques were made at Chattanooga, Tenn. and Wilmington, Del. Preliminary evidence from the Chattanooga tests reveals that the various solutions and techniques tested are not as effective as the procedure used in the sodium fluoride demonstration program.

DENTAL CARE STUDIES

More than 8,000 children are participating in dental care projects in Woonsocket, R. I. and Richmond, Ind. Conducted by the Public Health Service in cooperation with local authorities, these surveys are designed to determine dental needs, personnel requirements, and the cost of providing initial and continuing dental care for children.

Because of the backlog of dental needs, the first series of examinations and treatment took two and one-half years. The third series of treatments is now under way. In the second series, which required approximately a year and a half, somewhat less dental care was needed and the number of extractions per child was substantially lowered. It is anticipated that the third series will be completed within a year, when results of the entire survey will be analyzed.

Improving Health in Alaska

The special health program in Alaska, now entering its third year, has continued to grow as needs have become more obvious. The program has two major phases. The first is devoted to helping the Alaska Department of Health raise the level of health throughout the Territory. For example, the Public Health Service has strengthened Alaska's health program by operating mobile health units, via ship, rail, and highway, in sparsely populated and widely separated localities. Approximately $950,000 of grant-in-aid funds has helped support various health services in Alaska.

The second phase of the program involves research and investigation into special health needs and problems under arctic conditions. The Arctic Health Research Center with a resident staff at Anchorage is developing a program planned to answer basic questions about physical, mental, and emotional adjustment of the human organism to low-temperature environments. Progress was made during the year in detecting certain parasitic diseases in the Alaskan population.

Recent findings indicate that the newer forms and improved methods of DDT spraying are effective against the black fly larvae in Alaskan streams, without appreciable damage to fish or fish food. Widespread application under a variety of circumstances of the serosol spray unit developed in 1949 for the control of adult insects has produced additional proof of the effectiveness and economy of this device in Alaska. Efforts are still being made, however, to improve the design of the apparatus and increase its mobility.

Several other long-range studies are under way. They include studies of public and private water supplies and sewage disposal systems; accidental and violent deaths in Alaska; and an analysis of native diets and foods produced in Alaska.

Winning a Healthier World

The vital role of public health in helping to win a better world was sharply underlined in the past year. Throughout the world, almost half the people—more than one billion men, women, and children—are victims of preventable disease. These sick people are striving to improve their lot. They need to grow more food for their hungry children. They need better clothes and better houses. But they are handicapped by ill-health. Malaria has weakened their efforts to work the fields. Millions of them die each year from tuberculosis. Three babies out of every ten born alive die in infancy.

The plight of these people is a challenge to the United States. We know that the battle to win a healthier world is a basic part of our over-all effort for global peace and freedom. Without economic progress the vast suffering of millions of people in the world's underdeveloped areas makes them an easy prey of Communism. And economic progress is impossible in most of these regions without great improvement in public health. Disease control is now a major tool for economic development.

President Truman expressed the challenge: "For the first time in history, humanity possesses the knowledge and the skill to relieve the suffering of these people." The President proposed the Point Four

program of technical assistance to help these people help themselves. Congress approved the authorizing legislation for the program in May 1950. Under this program, a number of health projects are planned. Some of the health projects will be carried out by the World Health Organization and others by the United States in direct aid to individual nations.

During the year, the Economic Cooperation Administration (ECA) also began sponsoring emergency assistance programs in Southeast Asia, and other areas. Disease control is assigned a key role in these programs.

The Public Health Service was made responsible for the staffing and direction of teams of experts to carry out needed health projects, in both Point Four and ECA programs. The Public Health Service has prepared to meet its urgent responsibilities under these programs. Disease problems in the underdeveloped areas have been studied. Other governmental agencies have been consulted to develop a coordinated and balanced program. The Surgeon General has given priority to the needs of overseas programs for expert health personnel. Lists of health specialists qualified for overseas assignments have been developed. The strategy of attacking specific diseases in infested areas has been mapped out. A member of the International Health staff completed a 10-week on-the-spot survey of health conditions in the Near East and Southeast Asia. The experience of technical missions already in the field has been drawn upon.

Foreign Missions

GREEK MISSION

The Public Health Division of the ECA mission to Greece was established in 1947. Sixteen Americans are serving with the division, including five doctors, four nurses, and five sanitary officers. This three year program provides many dramatic illustrations of the effectiveness of a planned attack on disease as a major weapon in economic development. Before the war, more than 2 million Greek men, women, and children became ill from malaria each year. The mission now reports that the number of cases has been cut below 50,000. This is a reduction of nearly 98 percent. The mission reported in June 1950: "Malaria has been conquered as a major health problem in Greece."

The battle for a healthier Greece has been broadened to include other disease problems. In the fight against tuberculosis, for example, more than 1,000 beds for tuberculous patients have been added to Greek hospital facilities; a 200-bed sanitarium is being constructed; over 800,000 children have been tuberculin tested and 500,000 vac-

cinated against tuberculosis; and 500,000 people have been given chest X-rays.

Four new general hospitals are being built. Fifty hospitals are being repaired. Under the supervision of the four American nurses, more than 1,000 Greek practical nurses have been given 6- to 8-week training courses to aid them in caring for the sick. Fourteen Greek doctors and nurses have been sent to the United States and other countries for advanced study.

Progress has been made in improving sanitation. Over 5000 tons of pipe have been delivered. Water supply projects have been started in more than 100 places.

LIBERIAN MISSION

The pioneer work of the United States Public Health Service mission to Liberia, established in 1944, has provided a valuable guide in planning health projects in other underdeveloped areas. The mission has carried on an intensive malaria control program in the Monrovia area of Liberia. Mosquitoes have been attacked with DDT. Tests of chloroquine, an anti-malaria drug, have also been conducted. The mission has completed intensive surveys of the diseases handicapping the Liberian people. The mission chief has traveled over most of the country's 43,000 square miles by jeep and on foot, surveying disease problems.

The mission operates a model clinic in Monrovia, where 24,000 patients were treated last year. The new building for the nurses' training school is almost completed. Twenty nurses were graduated during the year. Thirteen Liberians are also being given special laboratory training in tropical diseases.

The expenditures of the Liberian government for health have increased five-fold since the establishment of the Public Health Service mission. This illustrates the way in which cooperative health projects may inspire increased efforts by local people.

INDO-CHINA MISSION

Early in July 1950, five Public Health Service officers flew to Saigon, Indo-China, to assist local health experts in carrying out a "blitz campaign" against malaria and other serious diseases. They were assigned to the Health Division of the special ECA mission to the associated states of Indo-China (Vietnam, Laos, and Cambodia). Supplies of DDT, chloroquine, penicillin, and various drugs to treat intestinal infections are being shipped to Indo-China to aid in the program. The team was the first of a larger group to be assigned later as part of the United States program of special assistance in Southeast Asia.

IRAN MISSION

Early in June 1950, a Public Health Service team completed a 10-week technical mission to Iran. The team laid the groundwork for a training program to combat Iran's chief diseases. Four-week training courses for village physicians, engineers, and medical officers from the Iranian Ministry of Health were conducted. The program included field demonstrations of DDT spraying methods, mass immunization techniques, and latrine construction.

LATIN-AMERICAN PROJECTS

Two Public Health Service officers completed a 4-month study of leishmaniasis in Paraguay during the year. The study of the coca-leaf chewing habit in Peru has resulted in the demonstration of a satisfactory method for the isolation of cocaine from human blood. The work, begun January 1, 1949, is being continued.

KOREAN PROJECT

A survey of health problems in South Korea was completed at the request of the ECA. Proposals for an integrated health program for South Korea had been submitted and were under consideration when war broke out in Korea in June 1950.

Training Disease Fighters

Many countries desperately need well-trained doctors and nurses to care for the sick and prevent disease. In the past year, the efforts of individual governments and the World Health Organization to meet this need were stepped up. Many of the foreign health trainees came to the United States to pursue their advanced studies. The International Health staff arranged programs and provided assistance to 385 such trainees and visitors during the year.

Schools and courses to meet the special needs of each trainee are selected. Special programs of field observation in State and local health units are arranged. Specialists are provided with opportunities to consult with United States experts in their fields. Study programs were arranged for 153 trainees who received fellowships under various United States grants or from other sources. These trainees came from Latin America (34), the Philippines (53), Greece (6), Western Germany (34), Japan (10), Austria (3), and other countries (13). Special programs were also arranged for 45 trainees from 17 countries, whose governments had requested such assistance.

Programs were prepared for 52 WHO Fellows who began studies in the United States. Nineteen American health experts desiring to make advanced studies abroad received WHO Fellowships. The

WHO was assisted in making these awards by the Fellowship Selection Board set up by the Surgeon General at the WHO's request.

Assisting World Travelers

American travelers began to visit foreign countries in record numbers during the year. They were provided with international vaccination certificates and information on current vaccination requirements for visits to countries abroad. This enterprise greatly reduced the inconvenience of travelers going abroad. The Public Health Service gave yellow fever vaccination free of charge to all travelers going to countries where the infection exists. The Public Health Service Rocky Mountain Laboratory at Hamilton, Mont., is the only institution in the United States authorized under the international regulations to produce yellow fever vaccine.

The World Health Organization

The United States continued to play an active part in the work of the World Health Organization, which it joined in 1948. The WHO is working all over the world toward its goal of winning for all people the highest possible level of health. The WHO has taken vigorous steps toward world-wide campaigns against the "top priority" diseases: Malaria, venereal disease, and tuberculosis. Regional offices have been set up to bring WHO services closer to the people. The aim of the WHO is to help the health departments of member nations do a better job—not to do their job for them. Therefore, every WHO project is conducted through the health department of the nation asking assistance.

The WHO carried out special projects in 76 countries and territories in the year. The projects ranged from demonstrations of malaria control in Southeast Asia to expect advice on refuse disposal and nutrition in the United States. Seven WHO experts completed a six weeks inspection of United States facilities for treatment of venereal disease. Twenty-one American health specialists, including five Public Health Service officers, served on WHO expert committees.

THIRD WORLD HEALTH ASSEMBLY

The Surgeon General of the Public Health Service served as chairman of the American delegation [2] to the third World Health Assembly held in Geneva, Switzerland, from May 8–23, 1950. The Assembly

[2] Other members of the American delegation were: Dr. Vlado A. Getting, Massachusetts Commissioner of Public Health; Mrs. John L. Whitehurst, past president of General Federation of Women's Clubs; Dr. H. van Zile Hyde, director of the Division of Health and Sanitation, Institute of Inter-American Affairs; Howard B. Calderwood, of the Department of State, and Dr. E. J. McCormick, a member of the Board of Trustees of the American Medical Association. Seven advisers, including the Congressional adviser, Rep. Walter H. Judd (R., Minn.), accompanied the delegation.

again reduced the United States share of the budget, this time from 36 percent to 35 percent. The 1949 Assembly had reduced the United States share from 38.5 percent to 36 percent. The budget for the calendar year 1951, based on the contributions of member nations, was set at $7.1 million. Funds from other sources make the total budget $7.3 million. The United States share of the budget for 1951 is $2.4 million. This is about $39,000 less than our assessment for 1950. Legislation raising the ceiling on the United States contribution to the WHO to $3 million a year was approved by Congress in July 1950.

The Soviet Union, China, Albania, Bulgaria, Byelorussia, Czechoslovakia, the Ukraine, Hungary, and Rumania withdrew from the WHO during the year. Their default on their contributions and slow payments from a few other countries forced the WHO to reduce its planned operations and stay within a level of expenditures of $6.3 million during 1950.

At the United Nations Technical Assistance Conference in June 1950, fifty governments, including the United States, pledged contributions to the United Nations Technical Assistance Fund. The WHO will receive 22 percent of the first $10 million of the United Nations Technical Assistance Fund and a slightly smaller percentage of the next $10 million. This Fund will enable the WHO to expand considerably its field demonstrations programs in underdeveloped areas.

World Health Projects in VD Control

Because venereal disease is a health problem of great significance in many areas of the world, the World Health Organization has taken steps to assist in the control of this disease. During the year, a WHO Syphilis Study Group toured venereal disease research and treatment facilities in the United States to evaluate control methods based on rapid treatment with penicillin. The tour was arranged by the Public Health Service. A member of the Venereal Disease staff also led a WHO demonstration of control methods in northern India where syphilis has a high prevalence.

PAN AMERICAN SANITARY BUREAU

The Public Health Service continued its close cooperation with the Pan American Sanitary Bureau, now the Regional Office of the WHO for the Western Hemisphere. Under this cooperative arrangement, United States experts have been detailed on scores of assignments to other American Republics. Hundreds of Latin Americans have been given training in this country. A general survey of health services in six Latin American countries (Peru, Chile, Argentina, Uruguay, Brazil and Puerto Rico) was made in September 1949.

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